

THE FIFTH SCHOOL YEAR

HERMAN T. LUKENS

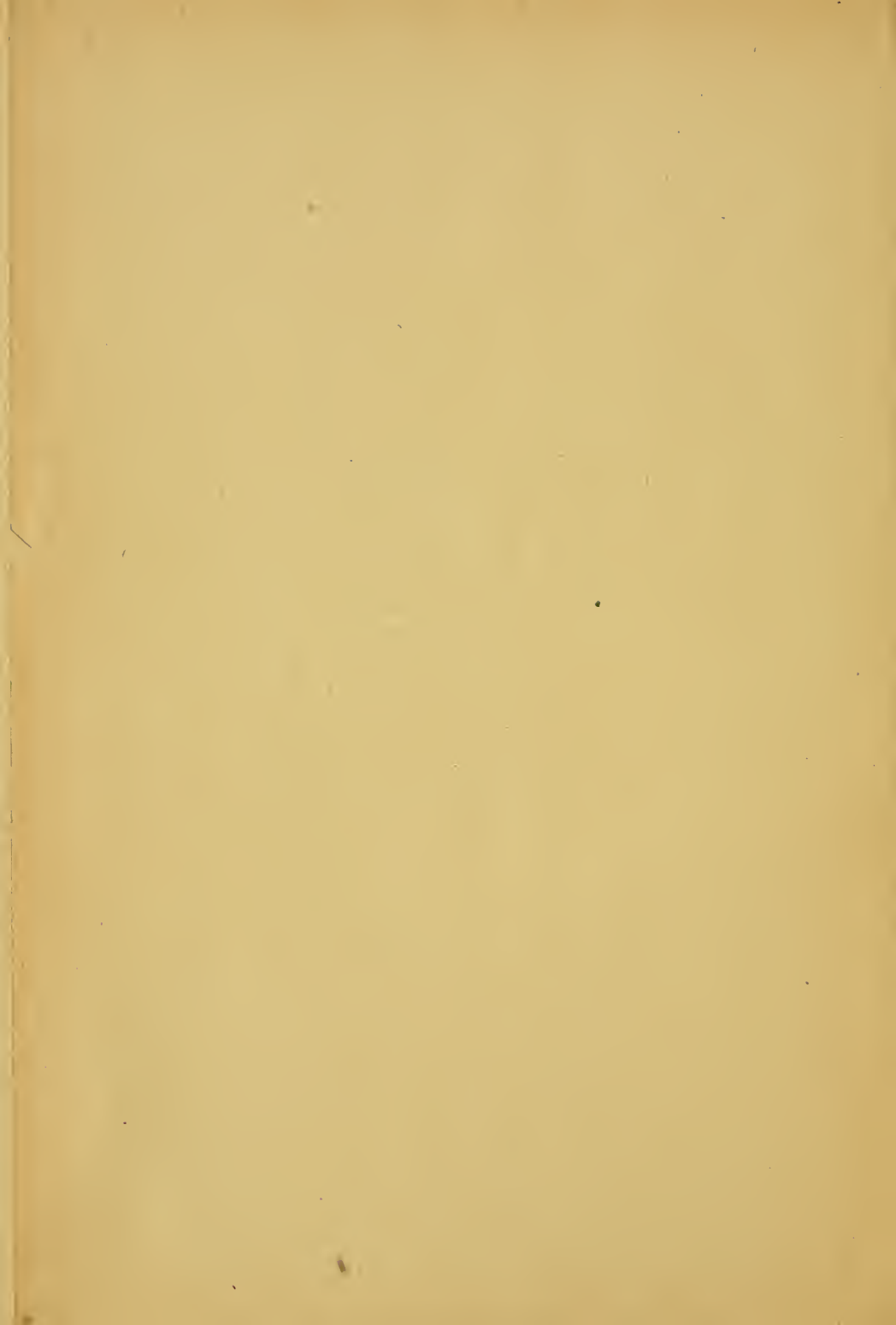


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FLOOR MAP SHOWING DENSITY OF POPULATION

(See December Geography, p. 108)

The Fifth School Year

A Course of Study with Detailed
Selection of Lesson
Material

Arranged by Months and Correlated

BY

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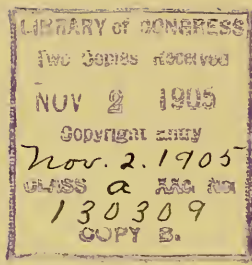
General Editor of the Series

Principal of the South-Western State Normal School
California, Pennsylvania

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PREFACE BY THE GENERAL EDITOR

"THE Fifth School Year" is one of the School Year Series, prepared by the training teachers of the South-Western State Normal School, at California, Pa.

Of the special qualifications of Dr. Lukens to write a book of this sort, it is unnecessary to speak. His fruitful and important work for several years as a teacher of fifth-grade pupils and of student teachers practicing in the same grade, gives him a vantage ground of personal experience for such an undertaking that few men of university training possess. The work of the general editor on this book and others of the series, has been confined to suggesting the general plan and urging others to undertake the execution.

It is not strange that teachers should be somewhat reluctant, as ours have been, to put in print their actual grade work for a school year. A teacher's ideal of what such work should be is always changing, and is always in advance of what he is able to set down in print. Yet in the all-important field of matter and method of instruction, how can progress better be made than by recording fearlessly the best one can do to-day and using it as the basis of to-morrow's betterments?

THEO. B. NOSS.

CALIFORNIA, PA.



PRINCIPLES ON WHICH TO BASE A COURSE OF STUDY

After reading "The Fifth School Year" in manuscript, my friend Dr. Charles E. Browne said to me: "You should state at the beginning of your book what principles you believe in, so that your readers may the better understand what your work means."

1. The course of individual development corresponds to the main stages of race development.

2. Thruout the curriculum the subjects should be presented historically.

3. The psychological order is of greater importance in arranging material than the logical order.

4. The supreme aim of school activity should be to develop right interests and ideals.

5. The suitable material for any given age is such as most deeply rouses the natural interests of that period.

6. Learning is essentially an active motor process and not one of passive sense-impression.

7. The work in every subject should as far as possible be organized with the depth of interest and the unity of connection that attaches to real life. Superficiality of treatment inoculates against all lasting interests.

8. The social life of the child is the basis of correlation. Cooking, sewing, manual work, etc., are types or fundamental forms of social activity and therefore form the proper medium for the child's introduction into the more formal subjects of the curriculum.

9. There is no sequence of studies in the ideal curriculum.

10. The process of education is also its goal.



CONSPECTUS

CONSPECTUS OF

	NATURE STUDY	GEOGRAPHY	HISTORY
SEPTEMBER	Distribution of Seeds. Food of Insects. Food of Birds. Bird Census. Weather: Barometer.	The Mediterranean. The West Coast of Europe. Directions and Distances from Home. Equinoxes.	The Homeric World. The Ptolemaic World. The Northmen. The Crusades.
OCTOBER	Tree Census. Oak Tree. Ventilation. Weather: Winds.	India and the East. Africa. S. Hemisphere vs. N. Hemisphere. Latitude and Longitude. Proofs that the Earth is Round.	The World of Marco Polo. Prince Henry. Columbus. Vasco da Gama.
NOVEMBER	Leafless Trees. Branching. Hibernation. Cocoons and Chrysalids. Life Histories. Weather: Clouds ; Temperature.	The Atlantic Ocean. The Solar System. South America and the Pacific. The Philippines.	Columbus. Americus. Magellan.
DECEMBER	Geologic Fauna and Flora. Coal Formation. "Footprints." Weather: Moon.	Mexico, Peru, Florida. Constellations. Winter Solstice. Hudson Bay and St. Lawrence. The Floor Map. The Gulf States.	Spanish Conquests: Cortes, Pizarro, De Soto. Other Explorations by French and English. Fall of Spanish Power.

FIFTH YEAR WORK

LITERATURE	NUMBER	LANGUAGE	THE ARTS
<p>Iliad and Odyssey. "The Golden Age." "Lays of Ancient Rome." "Thrall of Leif the Lucky." "Skeleton in Armor." "Discoverer of North Cape." "The Birds of Killingworth."</p>	<p>Roman Notation and Calculation. The Circle and Degrees. Time Measure. Problems in Dates. Height of Trees.</p>	<p>Literary Society thruout the Year. Historical and Geographical Atlases Each Month. <i>Grammar</i>: Parts of Speech. Subject and Predicate. Object Complement.</p>	<p><i>Music</i>: "But the Lord Is Mindful of His Own." "There's Music in the Air." "Just for To-Day." <i>Drawing</i>: Rapid outline sketching. <i>Making</i>: Bird-houses, ants' nest, clock face, viking ship, articles for acting.</p>
<p>Dialog of Marco Polo's Return. "Building of the Ship." "Columbus."—Joaquin Miller. Sinbad Stories. Raymond's "Drama of Columbus."</p>	<p>The Sphere—Area of Its Surface. Distances on Globe Calculated from Scale. Altitude of North Star. Longitude and Time.</p>	<p>Condensation. <i>Grammar</i>: Attribute Complement.</p>	<p><i>Music</i>: Columbus Songs. "Song of the Waves." "Farewell to the Forest." "Farewell to the Birds." <i>Drawing</i>: Human face. <i>Making</i>: Windmills, wind-vanes, junks, caravels, etc.</p>
<p>Raymond's "Drama of Columbus." Irving's "Columbus." Sun and Moon Myths. Fiske's Account of Magellan.</p>	<p>The Distances in the Solar System. Numeration of Large Numbers. Areas of the Oceans. Scale Drawing of the North Atlantic.</p>	<p>Order of Words, Pauses, and Inflections, use the Natural Diagramming of the Oral Sentence. <i>Grammar</i>: Objective Complement.</p>	<p><i>Music</i>: "The Spacious Firmament." "Queen of the Silent Night." "The Harp that once thru Tara's Halls." "From Greenland's Icy Mountains." <i>Drawing</i>: Objects in motion. Trees and birdseye views. <i>Making</i>: Astrolabe, lung tester, relief globe, Saturn model, etc.</p>
<p>Prescott and Fiske. "Stories in the Constellations." "Reynard the Fox."</p>	<p>Enlargement of Map of Southern States with help of Metric Ruler. Density of Population. Problems in Cotton, Sugar, Lumber.</p>	<p>Selections Written out from Memory. <i>Grammar</i>: Prepositional Phrases.</p>	<p><i>Music</i>: "He Shall Feed His Flock." "Softly Now the Light of Day." "Day is Dying in the West." <i>Drawing</i>: Suggestive lines and lines of force. <i>Making</i>: Raising of cotton, rice, orange trees, etc. State maps. Geological model. Historic dolls. Cotton gin.</p>

CONSPECTUS OF

	NATURE STUDY	GEOGRAPHY	HISTORY
JANUARY	Foods and Stimulants. Pets and Domestic Animals. Weather: Sunrise and Day's Length.	The Atlantic Coast. Middle Atlantic States. South Atlantic States.	The Settlement of the Atlantic Coast from the Hudson to Florida. Indian Fur Trade. Piracy Along the Coast.
FEBRUARY	Ants. Systematic Collection of Insect Pictures on Card Catalogue. Weather: Highs and Lows.	New England. St. Lawrence Valley.	New England. New France.
MARCH	Pond Life. Aquarium. Ice Age. Preparation of School Garden. Weather: Rainfall.	The Central States. Recalling of Fourth Grade Work on Prairies, Portages and Fur Trade.	The French in New France and Louisi- ana.
APRIL	Tadpoles. Frogs and Birds. Bird Calendar. Arbor Day. Preparation for June Flower Show and Planting of Garden. Weather: Irrigation.	The Western States. Recalling of Fourth Grade Work on California, the Yel- lowstone, and the Cliff Dwellers.	The Louisiana Pur- chase. Lewis and Clark, Fre- mont, Pike, Powell, Bering, Mackenzie. The Northwest Pas- sage. The Panama Canal.
MAY and JUNE	Brooks. Picnics to the Woods. June Flower Show. School Garden. Weather: Climate.	Commerce and Manu- factures of the United States. Foreign Commerce.	Review of the Work of Three Centuries in Discovery of America.

FIFTH YEAR WORK — Continued

LITERATURE	NUMBER	LANGUAGE	THE ARTS
<p>"Knickerbocker's History." "Gulliver's Travels." The Jungle Books.</p>	<p>Enlargement of Map of the Middle Atlantic States. Problems in Foods. Day and Night Chart. Square Root in Population Charts. Coal Charts.</p>	<p>Condensation and Rewriting. Teaching by Use. <i>Grammar</i>: Infinitives in Noun Constructions.</p>	<p><i>Music</i>: "Ring out, Wild Bells." "Kind Words." "Abide with Me." "O, Come, Come Away." <i>Drawing</i>: Memory drawing and simple perspective. <i>Making</i>: Sand table models of Jamestown, etc.</p>
<p>The Jungle Books. "The Courtship of Miles Standish." "Snow-Bound." "Among the Hills," etc.</p>	<p>Enlargement of Map of New England. Measuring Areas with Paper Units. Ratios in Areas. Per Cent in Areas. Density of Population.</p>	<p>Rhyming. <i>Grammar</i>: Infinitives in Adjective and Adverb Constructions.</p>	<p><i>Music</i>: "The Blue Bells of Scotland." "The Battle Hymn of the Republic." "My Old Kentucky Home." <i>Drawing</i>: Brush work for St. Valentine's Day. Outline drawing. <i>Making</i>: Scenes for the plays, models of Old Boston or Plymouth. Reassembling the parts of a clock.</p>
<p>"New England Tragedies." Parkman or Fiske on La Salle.</p>	<p>Enlarged Map of Central States. School Garden to Scale, using Metric Measures. Percentage in Geographical Problems. Density of Population.</p>	<p>Rehearsal of Good Colloquial Dialogs. Committing Prose to Memory. <i>Grammar</i>: Participles in Adjective Constructions.</p>	<p><i>Music</i>: "Jerusalem the Golden." "Now the Day is Over." "Robin Adair." <i>Drawing</i>: Scenes from nature study, geography and history. <i>Making</i>: School garden plan, bird-boxes, models of reaping machine, blast-furnace.</p>
<p>Review of Portions of "Hiawatha." Thompson-Seton's "Wahb and Tito." "Land of Little Rain," by Mary Austin.</p>	<p>Enlarged Map of Western States. Problems in Population, Area, and Irrigation, Involving Square Root, Ratio, Percentage, etc.</p>	<p>Story-Telling. <i>Grammar</i>: Participles in Noun Constructions.</p>	<p><i>Music</i>: "All Thru the Night." "Crossing the Bar." "We Lay Us Down to Sleep." <i>Drawing</i>: Outdoor sketching and illustrative drawing. <i>Making</i>: The school garden.</p>
<p>Long's "School of the Woods." Robert's "Kindred of the Wild." Poems of Nature.</p>	<p>Comparison of United States with Foreign Countries in Area, Population, and Industries. Review and Summary of the Year's Work.</p>	<p>Correspondence with Other Schools on the Work of the School Year. <i>Grammar</i>: Conjugation. Summary of Year's Work.</p>	<p><i>Music</i>: "O, Rest in the Lord." "Soldiers Chorus." "Decoration Day." Music festival. <i>Drawing</i>: Outdoor sketching and illustrative drawing. <i>Making</i>: School garden. Boats.</p>



THE FIFTH SCHOOL YEAR

INTRODUCTION

THE leading work of the fifth school year is the story of geographical discovery, from the earliest times down to the expansion of the United States into a world power, with the digging of the Panama Canal, which opens Columbus's attempted westerly route to the Orient. It is history, but it is the history of geography. In the spring, the geography becomes industrial, but altho it is chiefly the geography of the present, it still correlates with the history. The literature is in the closest association with the history and the geography.

The topic for the year in nature study is the inter-dependence of animals and plants, and in the main follows the seasonal changes. A daily weather record is kept. The work on this furnishes motive for considerable number work, astronomy, geography, and English. The pupils have organized the California Junior Naturalist Club, and manage in this way a considerable part of the nature work.

The work in number, language, drawing, writing, singing, making, modeling, etc., grows out of the work in geography, history, or nature study. Besides the simpler correlations in minor matters, the geography makes its chief demands for aid from the arithmetic in the scale drawing of maps and statistical charts. In the latter part of the year this work becomes the preparation of a statistical atlas of the United States.

All the songs selected are good, being in many instances classics from the great composers. Children have no time to

waste on shallow, evanescent tunes, that fail to inspire even if they do not actually degrade. The drill exercises should be directed to the mastery of the difficulties found in the songs.

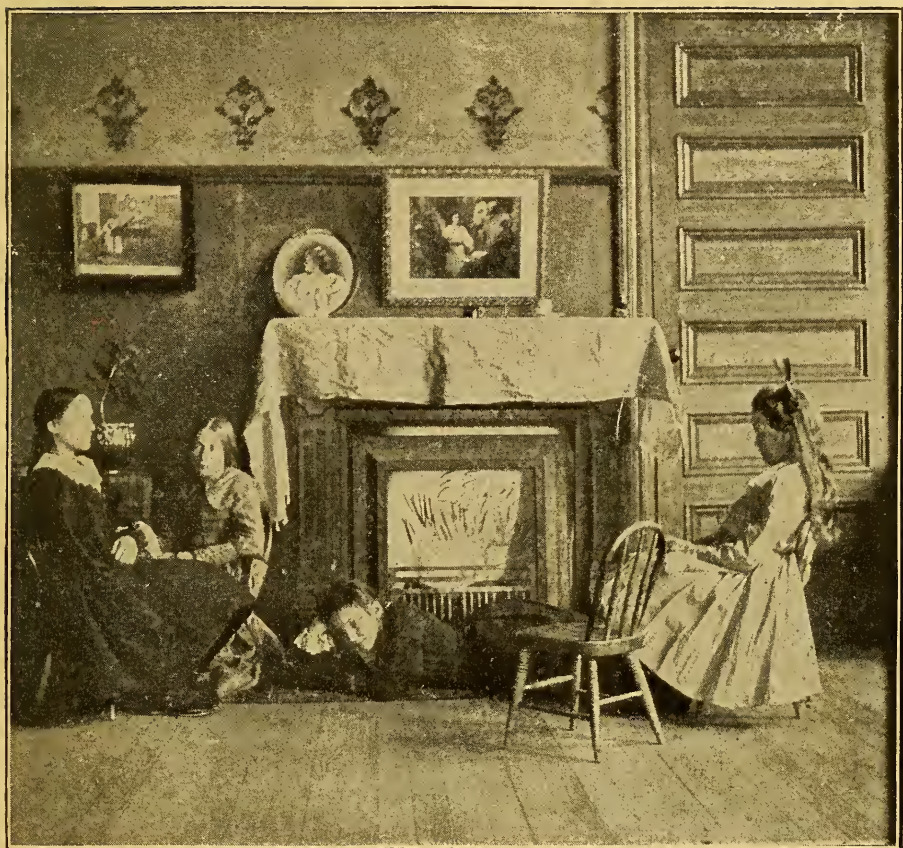
The English work grows out of the needs and opportunities of the Literary Society and the preparation of the historical and statistical atlases. For the society, besides the usual readings



A GROUP AT WORK

and recitations, a periodical is edited, including prose and rhyme, stories, current events, advertisements, puzzles, conundrums, and illustrations.

School work never should be commercial in its nature; the products of the school garden, of the work bench, of the weaving, of the cooking and the sewing are not to be gauged by the price the goods bring when exposed for sale. The purpose lies in the



LITTLE WOMEN — ACT I, SCENE I.

development of the pupil, not in the material product. If we train for commercial skill, we shall hinder development.

The main problem of our schools is properly to select and adapt the culture and material achievements of the race to meet the needs of development in the growing and immature pupil. This involves the element of idealized make-believe. The school life is not the actual life of the world, but idealized life as presented on a stage. The past culture and achievement of the race must be presented as a drama, idealized in thought,

pictured by the imagination, true to nature, intensely interesting, and acted out in the motor activity of school exercises.

Thus, the actual activities of the past struggle for existence become the play activities of the present education. In this sense the child in play recapitulates the history of the race.



LITTLE WOMEN — ACT II, LAST SCENE

We must aim, therefore, so to organize this play that it will be as earnest as any work, as real as any experience, as true as any facts, as interesting as actual life. What Miss Dopp is doing for the industries in education* somebody must also do

* "The Place of Industries in Elementary Education," published by the University of Chicago Press. See, also, her "Industrial and Social History Series," Rand, McNally & Co., publishers.

for the nature study, the literature, the mathematics, and the language work.

We have need of another Shakspeare to dramatize American history. The usual school dialogs and special-day exercises are not fit to be treated as literature. Longfellow's "New England Tragedies" are not wholly appropriate in theme for school presentation. Prof. Raymond's "Columbus" might be slightly remodeled and be made fairly usable, but it has too little of the element of humor. If we had such plays as Shakspeare's "Julius Cæsar," but treating the dramatic episodes of our own history, we should have the material in proper form for school use. Facts are well stated in our present text-books, but what the children need is dialog and acting. We must have scenes, councils, town meetings, elections, conferences, treaties, plots, street parades, cabinet meetings, colonial assemblies, courts, schools of the olden time, games, etc.

The life of De Soto or of Magellan would make as immortal a masterpiece as the tragedy of Julius Cæsar. Whoever shall worthily dramatize the life of William Penn will do more for the teaching of Pennsylvania's history than anybody has yet done. But it will require an artist of the first rank to see the essentials, idealize the true, and re-create the life of the past.

Do not degrade the drama or the dialog to exhibition purposes. The patrons of the school should be welcome at all times, but nothing should be rehearsed until it can be given as a public entertainment, and least of all for paid admission. It is intended that the acting of the "Drama of Columbus" and the other plays here recommended shall be done but the once, without any committing of lines, or even without a previous rehearsal. Such acting is a means of presenting vividly the matter of history so that it will be like the real events of life.

The teacher, as prompter, stage-manager, and invisible spirit, must be everywhere to direct, altho nowhere is he to be thought

of as part of the presentation. The children that take the acting parts repeat after the teacher just what he says, and take their cue in acting from him. This consumes but little more time than would be required for one reading of the text. As soon as the scene is finished, always give opportunity for questions and discussion, to make sure that it is rightly understood.

For the geography stereoscopic views are of the greatest value in aiding in the formation of correct notions of distant scenes, landscape effects, geologic formations, buildings, streets, elevated railways, harbors, ocean steamers, volcanoes, means of transportation, dress, fruits, flowers, irrigation, harvesting, manufacturing, mining, fishing, lumbering, sea beaches, etc. With a large collection of these views the children may store up correct images of the other parts of the country they have not seen. They may even write a "Diary of Our Journey thru North America," describing the actual scenes shown in the stereoscope.*

In the training of children opportunity must be given for individual initiative. The formation of a strong, healthy character depends upon such opportunity. The class should often be left by itself for short periods. Definite work may be assigned, monitors may be put in charge, or no direction whatever may be given, according to the degree of self-control possessed by the pupils. Give the children as much freedom as they can stand. A great deal of voluntary work should be secured and much work should be done ahead of time. Cultivate the feeling of responsibility. The work of learning is the learner's own work. Teaching can never take the place of learning. Without the pupils there would be no school, but the teacher is not essential all the time, and had better some of the time be absent.

* The stereographs furnished by Underwood & Underwood, 3 & 5 West Nineteenth Street, New York, are of excellent quality.

The school should be homelike. No expense should be spared to make it attractive and healthful. Time was when scholars had to be driven to school and flogged into learning, but "went storming out to playing." There is something radically wrong in a school to which the pupils do not like to go. If the children are better off in vacation than in school, the school is not doing its duty.

Our long vacations of from two to four and even five or six months are a vestige of a by-gone age when education was not



WOOD SPECIMENS AND STEREOGRAPHS.

conceived as conscious evolution. The summer is the best time of all the year to go to school, if the school is adapted to the season as it should be. The long vacation is for most children a time of enforced idleness and wasted opportunities — too apt to be spent in mischief and the acquiring of bad habits. The effectiveness of school-time is very largely counteracted by the waste of vacation.

Pupils should ask questions of the teacher, rather than the teacher ask questions of the children. Of course, the question is also a pedagogical tool of the first importance in the developing method of teaching; but things are never at their best unless the pupils are thinking and caring to know. When that is the case, they will be asking questions. Always respect a child's question and give him satisfaction so that he will come again. I have learned more from observing what my pupils ask about and how they frame their questions than from any other study of method.

Avoid the fragmentary, short answers that result from piecemeal questions from the teacher. Accustom the children to speak connectedly on a matter until they have finished their thought. It is very desirable, also, that they volunteer to add other connected thought, without waiting for the teacher to call for it. This shows most strikingly in the work of the Junior Naturalist Club and the Literary Society, which are intended primarily to furnish natural conditions for individual initiative.

No school that does not see its main purpose in character-building can be doing its whole duty to the children. It is possible to learn the book facts alone by reading. School life, however, is necessary to develop punctuality, honesty, order, neatness, care, thoughtfulness, kindness, respect for others, politeness, grace, self-control, and self-sacrifice. A hermit may be a scholar, but it takes contact with others to make a man or a woman.

Of course, it is not intended that any one class shall in a year do all that is here outlined for the Fifth School Year. The teacher using this book is expected to find suggestions in it for her own work, but it is not to be followed as a course of study for the year. Hence, there is an abundance of material offered, far more than the average boy or girl of eleven years can assimilate.

late. The details of a year's work should vary from year to year, and should have a local coloring and an individuality.

Do not assign new topics or so many pages in the text-book for home work, expecting to hear the recitation of the lesson next day. The home work should be the finishing of the work previously planned, discussed, and begun at school. The pupil's supreme need of the teacher is felt at the opening of a new vista in a new thought realm, in attacking a newly found problem, in adjusting his thought and feeling to the epochs of history, in deciding on the best methods of procedure, and in the overcoming of doubts and uncertainties. These matters demand the cordial sympathy of class work. For home work, on the other hand, all forms of written drill, recapitulation, summary, and individual study or memorizing are appropriate.

SEPTEMBER



NATURE STUDY

LET the children begin the collecting of insects. Have them keep diaries and note down the names of bushes, trees, or other plants that they find the caterpillars eating. The important thing is to note the surroundings and what the insect is doing. Note its feeding habits, mode of cutting the leaf, postures, time of feeding, means of escape or defence. Have vivaria at school, and illustrate life histories whenever possible. Mount the insects by the method described in Hodge's "Nature Study and Life," Chapter IV.

Hodge's grouping is natural: 1. Insects of the Household; 2. Insects of the Garden; 3. Insects of Field and Forest; 4. Beneficial Insects; 5. Insects Beautiful and Interesting. Such classification is at present more to the point than that into

orders and families. Teach something of the immense number of insects, both the individuals of each species and the millions of species. Look up the arithmetic work on page 65 of Hodge's book, where he calculates that a single female mosquito may produce between one and two million female mosquitoes in a single month.

In studying the harm wrought by insects, try to give definite ideas by comparisons. For example, it has been calculated that the insects destroy about half of all the produce of the soil, thus dividing with man about equally all the crops. Prof. Riley estimates the number of insect species on the earth at 10,000,000.

This gathering up of the testimony of havoc wrought by insects should be followed by the consideration of the means by which it is held in check. Study the food of birds, frogs, toads, and lizards. On page 323 of Hodge's "Nature Study" is a most interesting chart of the food of our common birds.

The beginning of the map drawing for the year may well be made on a chart showing the bird census of the neighborhood of the school. During the winter months bird-boxes may be made ready to put out in the spring. The spring study of the tadpole will have added interest from the September work on insects.

If the children have had garden work in the fourth grade, the past spring and summer, the school garden will naturally form the center of interest for the work this fall in the fifth grade.

THE CHAUTAUQUA JUNIOR NATURALIST CLUB

The nature study work done under the auspices of Cornell University is managed by the children in their Junior Naturalist Club. *Boys and Girls*, published in Ithaca, N. Y., comes monthly for fifty cents a year. It contains each month the club lesson and many other articles suggestive of the study of animals. The lesson is usually accompanied by questions that

guide the children in their observation as well as in their discussion during the club meeting.

The club has president, vice-president, secretary, assistant secretary, and treasurer. Meetings are held whenever called by request of three or more members who have something to present to the club. The president prepares the order of topics and guides the discussion. The members sometimes present written papers and sometimes put drawings on the blackboard, but the discussion is usually conversational, each one contributing as he has a mind to, but always observing the formality of addressing the president and receiving recognition.

THE WEATHER RECORD

The children should keep a daily weather record. After trying a good many different forms we have adopted the one shown here. If neat work expeditiously done is required, a printed outline is necessary. But the outline may be much simpler than this one, and if a simple enough form is chosen the children may rule their own. Each point noted in the record will need extended treatment in class before it can be fully understood. Thus the barometer, wind, thermometer, moon and stars, sun, High and Low on the United States Weather Map, rainfall; and yearly averages and summaries with charts, form the subjects for the course thru the year. The daily record should be noted down in symbols instead of written words; thus, for the wind directions draw arrows, for the sky draw a circle shaded to represent clouds.

For September the topic treated is the barometer. Begin with the simplest and most familiar things that show the air pressure, e. g., lifting water with a pipette, inverting a half-filled jar of water over a basin of water, turning a tumbler of water upside down with only a piece of paper over the top, etc.

Weather Record of William Brown

WEEK NUMBER...19...	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Summary
DATE JAN. 1904	9	10	11	12	13	14	15	1/9 to 1/15
SUNRISE	7:23	7:22	7:22	7:22	7:22	7:21	7:21	2 min. earlier
LENGTH OF FORENOON	4:37	4:38	4:38	4:38	4:38	4:39	4:39	2 min. longer
SUNSET	4:51	4:52	4:53	4:54	4:55	4:56	4:57	6 min. later
LENGTH OF AFTERNOON	4:51	4:52	4:53	4:54	4:55	4:56	4:57	6 min. longer
DAY'S LENGTH	9:28	9:30	9:31	9:32	9:33	9:35	9:36	8 min. longer
MOON AND STARS								Third Quarter
PRECIPITATION	S. S.	-	-	-	-	R. S.	S. -	.32"
SKY								CLEAR 4 TIMES
CLOUDS	A-S.	A-S.	-	-	-	Ci. Cu. A-S.	N. N. N. S. Cu. S. Cu. Ci. Fr. Cu.	CIRRUS 2 CUMULUS 5 STRATUS 5 NONE 3
BAROMETER 29 in.								H. 29.37" on 1/5 L. 28.9" on 1/9
WIND								PREVAILING WIND W. HIGHEST 90° LOWEST 10°
THERMOMETER								HIGHEST 38° LOWEST 13°
INDICATIONS								STORM CENTER PASSED US ON
WEATHER MAP	HIGH CAL. & FLA.	ONT.	NEV.	NEV.	G. of MEX.	FLA.	WED.	
DIFFERENCE FROM NORMAL	LOW +2"	+1"	+3"	+3"	+2"	+3"	1/13	

ONE FORM OF WEATHER RECORD

The action of the lift-pump and of the siphon will also help to make it clear. What causes this pressure of fifteen pounds to the square inch?

If the school has an air pump, the weight of air may be directly measured. Twelve and a half cubic feet of air weigh

one pound. All the air weighs five quadrillion tons. Illustrate the transmission of pressure in all directions by the case of other fluids, as water. This pressure makes water leak through the holes in the bottom and sides of a leaky vessel filled with water. The upward pressure is shown by the water entering through the holes in the bottom, when the empty vessel is immersed in water.

If possible, construct a barometer for the pupils by filling a glass tube thirty or more inches long with mercury and then inverting it in a cup of mercury. Weigh the mercury in the tube and divide its weight by the area in square inches of the bore of the tube. The quotient will be the atmospheric pressure per square inch.

Secure if possible the daily weather maps of the Government Weather Bureau. Note the barometer readings in different parts of the country, the position of the "High" and "Low" on successive days as the storm center sweeps to the eastward.

For \$1.55 any one can get a thousand copies of blank maps, Form DD, by sending to the Bureau. These are invaluable for much of the work in geography, history, and weather record. On these blank maps mark the position of High and Low for each day from their first appearance in the northwest till they disappear from the continent off the Atlantic Coast. Compare the local reading of the barometer with the movement of the High or Low in passing us.

GEOGRAPHY

THE ancient world was the land around the Mediterranean Sea. Recall what the pupils have had in previous grades as to the Homeric world, and draw an outline map of the world as Homer describes it. This gives the naïve view, as the world looks from a mountain-top — round like a circle. Greece is of course the center, and details are less and less exact and correct

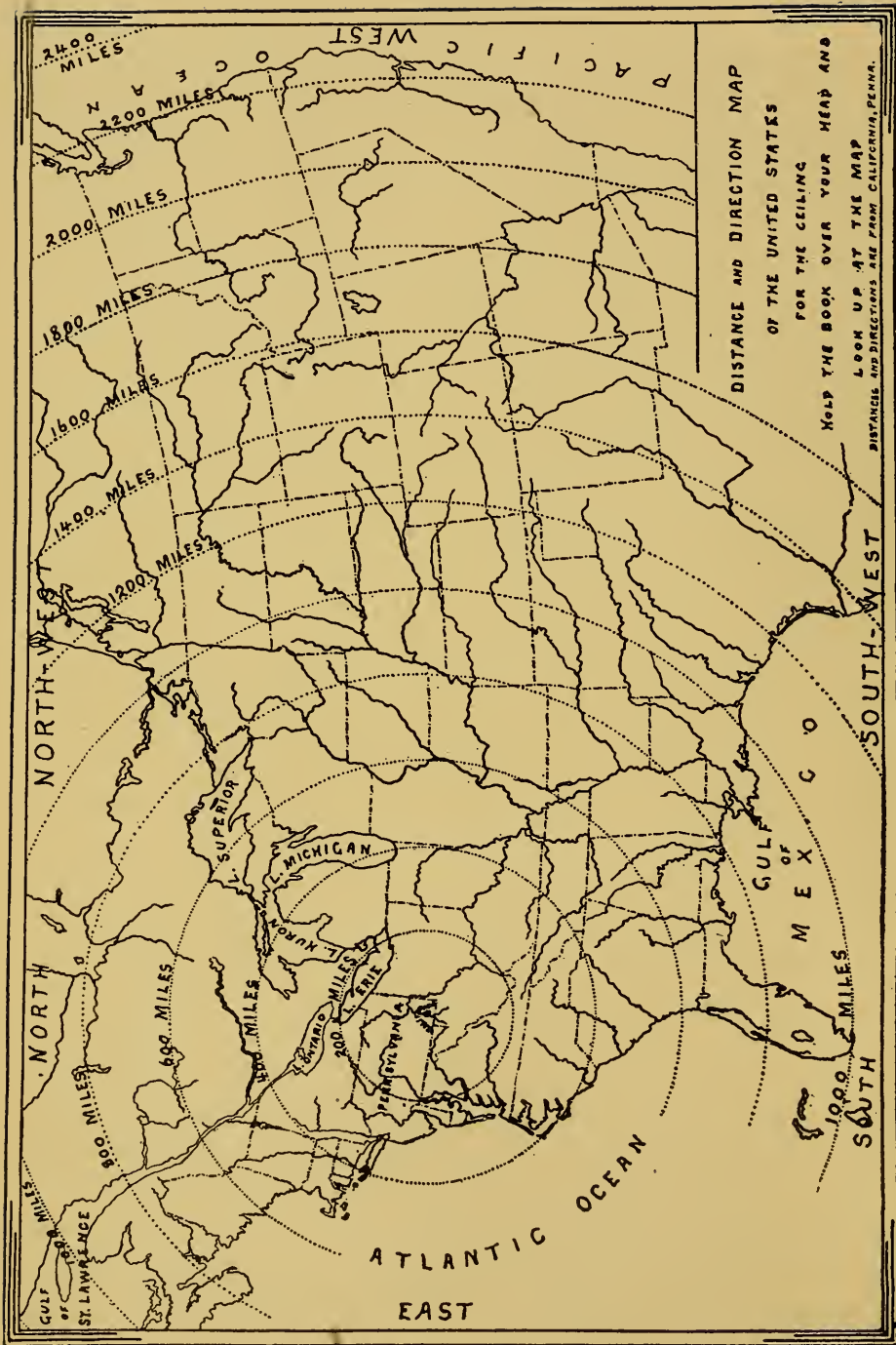
as we go farther from home. In the golden West are the Isles of the Blest and the Elysian Fields. The commerce of Tyre and Sidon extended this knowledge to the pillars of Hercules and made the Mediterranean Sea known from one end to the other.

Similarly, we should build out an image of the world with our home as the center, and by thinking of the directions and distances from our own town get used to conceiving of the world with reference to where we live. It is well for this purpose to draw a series of concentric circles about a star on the floor or, better still, on the ceiling, marking the cardinal points of the compass and letting the distances between the circles correspond to the distances from our own town. Then mark on this chart as many of the chief places in the country as it is desired to locate in this way.

Repeated practice in thinking of the distance and pointing in the direction of Philadelphia, Chicago, St. Louis, Panama, Buffalo, Charleston, etc., is necessary to keep the real earth in our thoughts instead of the maps or charts of our schoolroom.

The early fixing in mind of direction is of the utmost importance. The direction of the shadow of a plumb-line at noon should be marked in a convenient place. A school-made sundial should be set up and daily watched. A pocket compass will add to the interest and convenience of determining the north. Teach the children to recognize the pole star by the Great Dipper. Train them to tell the north side of trees by the green on the bark. Often take the geography class out of doors for a lesson, and then have the pupils point out the direction and state the distance of places; e. g. (pointing), "Two hundred and fifty miles due east of here lies Philadelphia; the same distance northwest of here is Detroit," etc.

Get a wooden butter bowl and sketch the shore line of America and Europe on its outside, making the home town the center.



DISTANCE AND DIRECTION MAP FOR THE CEILING.
(Hold the book over your head and look up at the map)



BUTTER-BOWL HEMISPHERES

This will bring out many new and interesting facts, e. g., that there is more of the earth southwest or southeast of us than there is northwest or northeast of us.

It will be helpful to make a similar butter-bowl hemisphere with Athens as the center or pole. The flat bottom of the bowl serves to represent the part nearest home that looks flat.

The Roman world should be studied from Ptolemy's map and a butter-bowl model with Rome as the center, but now it might be well to represent Ptolemy's parallels and meridians. A six-inch rubber ball will serve admirably to represent the

entire earth and show what proportion of the whole was known to the Romans, as well as the fact that they did not know how large around it was.

For all the geography work a large globe is very necessary. We have found it quite feasible to make a fifty-inch hemisphere as follows: Make the ribs of the dome of wood, firmly braced together, and then cover them with a basketwork weaving of thin pliable strips of wood, leaving meshes large enough for



CLAY MODEL OF QUARTER OF THE EARTH

plaster to clinch. On the outside of this spread a mixture of thoroughly macerated paper pulp and plaster such as engineers use to cover their steampipes. This does not crack on drying, and makes a very light and serviceable foundation for the modeling.

On this the physiographic features are modeled in relief, in white zinc or white lead. After the features are finished the

whole should be covered with a coat of varnish to protect the surface.

The latter part of the month takes our attention to the west coast of Europe as we study the discoveries and explorations of the Romans and later of the vikings of Norway.

Thruout the year the daily study of the government weather map is familiarizing the pupils with the geography, physical and political, of the United States. They learn to think of the country as a whole, and to follow the course of a storm, cold wave, or high pressure area, clear across the country. They thus get a better idea of climate, and the elements that compose it, than can be otherwise obtained.

HISTORY AND LITERATURE

THE aim in the history work is to start with the naïve view of the flat world of Homer's time and build out the idea of the globe by the steps that the race has taken in the discovery of the world. The chief advances made by the Romans and the Northmen form the work for September.

James Baldwin describes in a charming manner how Phemius drew a map in the sand and taught the twelve-year-old Odysseus the geography of the known world. The first chapter in "A Story of the Golden Age," can readily be worked into shape for acting out as a school play.

Not only is such presentation more effective than mere reading, but the preparation of the play, the rehearsals, the thinking one's way into the parts, and the making or adapting of Greek costumes, implements, and ways, with the learning an occasional Greek word, will bring the whole thing that we are teaching more fully before the children, and with a smaller expenditure of time will leave a more lasting impression. Portions should be read from the Iliad and the Odyssey, recalling what

was taught in the previous years. Trace on another map of the Mediterranean the wanderings of Odysseus.

Have the children prepare an enlarged copy of Ptolemy's map of the world and use it in a presentation of "A Day in a Roman School," in the second century. Many of the details can be arranged by consulting George Clarke's "The Education of Children at Rome." Read Macaulay's "Lays of Ancient Rome." Act out Shakspeare's "Julius Cæsar," or selected portions of it. Read portions of Liljencrantz's "The Thrall of Leif the Lucky," to get the spirit of the viking days. Here, too, arrange some dialog scenes on the voyage. Commit to memory Longfellow's poems "The Skeleton in Armor," and "The Discoverer of North Cape." Read Lowell's "The Voyage to Vinland."

Outline the interval of the Dark Ages and the revival of interest in the East due to the Crusades. In connection with the nature study read Longfellow's "Birds of Killingworth."

Thruout the year have the children commit portions of the Bible to memory. They should learn the Ten Commandments, several psalms, and portions of the Sermon on the Mount.

The school should have a library with a constantly increasing number of books accessible to the pupils. The children should be encouraged to read, but should not be required to do the task work of writing book reports. No books of an objectionable character should be allowed in the bookcase, and the children should be permitted to browse at their own sweet will.

The school will need a considerable number of the best histories for reference. The study from the books and the preparation of charts, maps, and other written work had best be done in school, where the teacher is at hand for suggestion and help. The persons, implements, ships, houses, and scenes studied should be sketched in large, bold, free outlines on the blackboard and on paper.

Provide a chronological chart, the larger the better. Tack

half-width slate blackboard cloth along as much of the wall as you can spare above the regular slate blackboard. Divide it by vertical lines into equal spaces for the centuries and half-centuries and date these. Remember that the centuries B. C. begin with even hundreds (900, 800, etc.); while the centuries A. D. begin with the even hundreds plus one (1, 101, 201, 301, etc.). Then write in the names of persons and events, and picture striking scenes or suggest them by symbols, national flags, and typical tools or implements. In Homer's area on the chart draw a sketch of Homer's world; for 753 B. C. draw the wolf that suckled Romulus and Remus, etc.

Fill the otherwise empty periods on the chart with characteristic data to show what was then going on in the world. Remember that we fail to realize the length of past time chiefly because we do not know what was going on in those past centuries. If the chart has long gaps in it, it will fail to serve as a means of picturing the past ages. These collateral events need not be dwelt upon.

The children should be led to prepare a picture chart of chronology for the last five centuries. This chart may be made on long strips of manila paper measured off into centuries. Paste pictures on it that have been cut out of old books, magazines, newspapers, etc. Pen-and-ink sketches with some brushwork and topics printed in small capitals will give form to the series of events.

The corresponding European history may be arranged on a parallel chart above the American history. This will serve very helpfully to keep European causes of American events in view, and will also familiarize the children with the lists of sovereigns.

Any teacher who has artistic ability may make these history charts into an ornamental frieze that will extend around the room, adorning it as no meaningless frescoes or wallpaper pattern

can, and leaving on the minds of the pupils a lasting image of the stream of time and its chief events.*

NUMBER

THE motive for the work in arithmetic comes from the nature study, the geography, and the history. We need to read the barometer to the tenth or perhaps even to the hundredth of an inch. The rainfall is measured in tenths of an inch. The time of sunrise and sunset, the length of the day, the length of the night, the difference in length of the day and the night, the amount of change from day to day and from week to week, the length of the forenoon and the length of the afternoon familiarize the children with time measure.

The geography makes necessary the study of the circle, the determination of its area and its circumference, and the division of its circumference into degrees. Make a shadow stick to measure the slant of the sun's rays. (See directions in Jackman's "Nature Study," pages 61 and 62.)

The chronology chart in history makes it necessary to have a frequent, thoro drill on the flow of time, the numbering and counting of the centuries, the difference in time between dates, etc., in order to develop in the mind of the pupil a graphic symbol of the stream of time. Ask how old Cæsar was in the year 50 B. C. In what year was he twenty-five years old? If such questions are not readily answered, enlarge portions of the chart and show the individual years which may then be counted.

Teach the Roman Notation and carry it far enough in exercises of addition, multiplication, and division to bring out clearly the great advantage of the Arabic place-value notation and ciphering in columns. Thruout the year lay great empha-

* See the History Chart prepared to accompany this book and intended for the pupils' use. Price 60 cents a dozen. A. Flanagan Company, Publishers.

sis on orderly arrangement in straight vertical columns, as necessary to preserve the correct place value of the figures. In long division arrange the quotient above the dividend, not at the right of the dividend.

Whether the above exercises are to be considered arithmetic



SURVEYING ON THE CAMPUS

or history makes no difference to the teacher nor to the children. But the work that is exclusively arithmetic must on no account be omitted, under the mistaken notion that the children will get all the number work they need in such ciphering, with nature

study or geographical material. This strictly mathematical work is of the nature of drill for proficiency in the mathematical processes. Therefore have daily drills in the fundamental processes, demanding rapid and correct work.

A large part of the dullness in arithmetic comes from insufficient familiarity with the simple combinations of the multiplication table and the addition table. These must by practice be made so familiar that they are absolutely certain, and hence do not raise treacherous doubts when we are solving problems. If some pupils do not need the drill, excuse them from it, or use them as pupil teachers to drill the rest that do need it. Some of the dullest will need it all the year.

It is perhaps as important to be able readily to see the factors of a number as to know at a glance the product of those factors. Have the pupils count by threes, fours, fives, sixes, etc. Have them name the factors of eighteen, of fifty-six, of seventy-two, of twenty-seven, etc. How many times is seven contained in sixty? in forty? in fifty? in twenty? in thirty? What is the arithmetical complement of seven? of six? of two? of fifty-six? of seventy-two? of twenty-five? etc. The Southworth-Stone Arithmetics have excellent devices for drill.

Pieces of slating cloth that can be hung up like a wall map are very useful in this work. Exercises may be written on them in advance of the lesson and then unrolled at a moment's notice, without occupying any of the slate blackboard. Or, the cloth may be hung on a movable stand and set up in any part of the room that suits the lighting requirements. Such exercises as Miss Aiken recommends in her book on "Methods of Mind-Training" may be used on these roll backboards, if revolving blackboards are not to be had.

During the pleasant September weather the class should do some measuring and calculation of distances out-of-doors. Have the children measure off a mile with a surveyor's chain or

a half-rod pole, or even step it off and calculate the number of steps each child takes to the mile. Fix similarly the units of area, the acre, the square rod, the square yard, the square foot, and the square inch. Measure the distance exactly to near-by points of interest, the children's homes, adjacent villages, or the like. A little ingenuity will suffice to improvise a serviceable cyclometer out of a light carriage wheel, or a real one may be used on a bicycle.

Such work as is described in the *Journal of Geography* for October, 1903 (p. 431), "To Make a Map of a Certain District by Means of the Plane-Table," is not too difficult to be undertaken. All of the apparatus may be home-made. By such means the distance across rivers or to inaccessible hilltops may readily be calculated. The chief need for accuracy in such work is in drawing the lines. If for no other reason, the work should be done to demonstrate to the pupils the importance of care and neatness in their work.

The height of buildings, trees, flagpoles, etc., may readily be calculated by means of similar triangles. Where one can reach the base on horizontal ground, the isosceles right-triangle may be used. Make the frame of wood, the equal sides being about twelve or fifteen inches in length. At the two oblique angles arrange sights for sighting along the hypotenuse, and from the upper corner let a light plumb-bob be suspended to enable the observer's assistant to tell when the base is horizontal. The observer holds the instrument to his eye, sighting along the hypotenuse, and advances toward or recedes from the object whose height he is measuring, until he just sees the top of it in line with his sighting points. He then has only to measure the distance from his position to the base of the object. This distance plus the height of his eye from the ground is the same as the height of the object.

LANGUAGE

Reading maketh a full man, conference a ready man, and writing an exact man.—*Bacon's Essay on Studies.*

THE motive for the language expression of the whole year comes from the needs of the Literary Society, the making of the Historical Atlas and the Geographical Atlas, the written home work, and the summaries and tests. This is about the order of their importance.

The Literary Society should be able to give opportunity for all sorts of literary talent and practice. The aim must not be merely to amuse or pass the time. Thoro preparation must be demanded by the children themselves. The performances are the culmination of the week's work, and represent its spirit. Each pupil should be expected to commit to memory at least one new selection each month.

We need, also, a collection of short dialogs for acting out. The dozens of such collections I have sampled are not suitable. Most of them lack point, and afford very little acting of a kind that appeals to children. Even dialogs must be good literature in order to be satisfactory.

For reading in the society the children prefer selections that it takes only five to eight minutes to read. They like stories — fairy stories or true stories, stories from the nursery, or stories of adventure and deeds of blood.

For essays the most successful topics are personal experiences, accounts of excursions, visits to friends, trips on the river and into coal mines, etc. Correspondence with other schools, and exchanges of products, pictures and school work, are also wholesome ways of coöperation.

Sometimes it is possible to develop a speech-making talent in a boy or girl and have really creditable addresses on the occasion of special celebrations. The properly managed debate is one of

the best literary exercises that we have. The selection of proper subjects is not easy, and depends to some extent on local conditions. Conscientious preparation on the part of the principal debaters is essential for success.

But it is the miscellaneous debate that is most interesting and most profitable for the whole class. I have never seen a whole class so thoroly aroused and eager to participate as in the miscellaneous debate. Thought is nearer being at white heat from interest then than any other time.

SUBJECTS FOR DEBATE

1. Resolved, That Magellan was a greater sailor than Columbus.
2. Resolved, That pupils should share in the government of the school.
3. Resolved, That whispering in school hours is a necessity, and should be permitted except in examinations.
4. Resolved, That the hen that lays the egg has a mother's right to the chick that hatches from it.
5. Resolved, That hope of reward is a better motive than fear of punishment.
6. Resolved, That the more we know the happier we become.
7. Resolved, That it is never right to get angry.
8. Resolved, That we were happier when five years old than when ten years old.
9. Resolved, That the pen is mightier than the sword.
10. Resolved, That city life is better for all practical purposes than country life.
11. Resolved, That women should have the right to vote and hold office.
12. Resolved, That every one should read the daily newspaper.
13. Resolved, That water is more destructive in its effects than fire.

14. Resolved, That Pennsylvania is a better state to live in than New York.
15. Resolved, That spring is more delightful than autumn.
16. Resolved, That childhood is the happiest time of life.
17. Resolved, That girls are more useful than boys about the house.
18. Resolved, That girls cost more than boys for their board and keep.
19. Resolved, That the school year should consist of at least nine months.
20. Resolved, That arithmetic is a more useful study than geography.
21. Resolved, That cooking should be taught in the public schools.
22. Resolved, That boys as well as girls should learn to sew and cook.
23. Resolved, That girls as well as boys should learn to play ball, and saw and drive nails.
24. Resolved, That girls are more orderly than boys because they are wiser.
25. Resolved, That summer is better than winter.
26. Resolved, That this country should have been called Columbia in honor of its real discoverer.
27. Resolved, That the lands belonged to the Indians as Roger Williams said.
28. Resolved, That King Philip waged a righteous war in self-defense.
29. Resolved, That the Monongahela is better than the Allegheny.
30. Resolved, That it is better to live in the Old Country than in America to-day.
31. Resolved, That President Roosevelt did right in making a treaty with Panama.

32. Resolved, That the railway is more important than the steamboat.
33. Resolved, That De Soto was a greater explorer than La Salle.
34. Resolved, That Portugal did more for the world than Spain in the fifteenth and sixteenth centuries.
35. Resolved, That it would have been better if the French had triumphed in the struggle for North America.
36. Resolved, That the sailor is more to be honored than the soldier.
37. Resolved, That the game of football ought not to be encouraged. Or, Resolved, That baseball is better than football.
38. Resolved, That iron is more serviceable to mankind than gold.
39. Resolved, That the farmer is more useful to society than the manufacturer.
40. Resolved, That the world is growing better.
41. Resolved, That gunpowder has had more influence on mankind than the printing press.
42. Resolved, That corporal punishment should be abolished in schools.
43. Resolved, That there is more pleasure in anticipation than in realization.
44. Resolved, That strikes are justifiable.
45. Resolved, That conscience is a true guide.
46. Resolved, That Thomas Jefferson did more for the United States than Benjamin Franklin.
47. Resolved, That knowledge is more to be desired than wealth.
48. Resolved, That vertical writing is preferable to the slant.
49. Resolved, That it is better to live in the twentieth century than to have lived in the fifteenth.

50. Resolved, That the cat has more sense than the dog.
51. Resolved, That paper is more useful than leather.
52. Resolved, That wood is more useful than iron.
53. Resolved, That doctors are more useful than lawyers.
54. Resolved, That gunpowder is more useful than steam.
55. Resolved, That the microscope reveals more wonders than the telescope.
56. Resolved, That New York city is the best place in the United States in which to live.

The debate is liable to degenerate into sham formalism, or sophistry, unless live issues are chosen, honest convictions expressed, and decisions acted on.

In place of debates speeches may be made on topics previously announced. The debate is based on rivalry, and is medieval in its origin as a school exercise, but such discussions as I mean would not necessarily have two sides at all, and would be coöperative in nature.

TOPICS FOR SPEECHES

1. How may we protect our song birds and our insectivorous birds?
2. How may we make our town cleaner, more healthful, and more beautiful and attractive?
3. Any topic of local interest as, for example (for pupils in California, Pa., schools), the opening of the trolley line to Pittsburg.
4. A trip on the Monongahela.
5. Famous trees.
6. What our school needs, and how to get it.
7. Superstitions.
8. Fifty years ago.
9. The early vikings.

The periodical should be the coöperative work of all in the society. It should have an editor, with one or more assistants. The editor may be responsible for the general arrangement of the paper, sorting the items, and putting them in order for presentation to the society. He should write an editorial on any appropriate theme he chooses, and try to make the paper reflect the best judgment of the pupils. One assistant editor should review current events and attend to the puzzle corner of the paper. There should be an illustrator to cartoon the happenings of the week. The stories, jokes, rhymes, advertisements, and other articles should be contributed by the various members of the society.

The Pickwick Portfolio, as described by Louisa M. Alcott in "Little Women," and *The Bubble*, published at Charleroi, Pa., by Karl Keffer Jr., may serve as samples of successful amateur periodicals. At the St. Louis Exposition more than a score of such weeklies and monthlies, edited and printed by school children, were exhibited.

Sometimes the roll is called for responses from the members. This makes a very interesting exercise in which all have a share. The responses may be quotations from literature, proverbs, facts of current interest, or facts of science, anecdotes, conundrums, or puzzles. Special quotations from a particular source may be arranged for celebrations or other occasions.

The literary exercises should be interspersed with singing, and with instrumental music, too, if possible. Short dialogs with simple but effective acting, and with but few accessories for scenery, are very much liked by the children. The rehearsals in preparation for these give the teacher an excellent opportunity to study the children out of school, and so make it possible for him to learn their strong and weak points.

Indeed, the pleasantest time of the day, a veritable "children's hour," has been the hour after school is over when a score

or more usually stay for choir practice, rehearsal, to draw on the board, to look at stereographs, to read *St. Nicholas*, or *The Youth's Companion*, to play on the piano or to dance, to turn somersaults on the horizontal bar, to look through the camera obscura, to play bean bags, to get individual help with their lessons, to feed the fishes, to water the plants, to work in the carpenter shop, to look at the ball game on the athletic field, to make up lessons from which they have been absent, to fill out the weather record, to have their pictures taken, or simply because they like to stay.

I believe those who stay learn more in that hour than in any other hour of the day. Often a pupil will come to me at such a time and open his or her mind and heart in the frankest kind of way. Difficulties and misunderstandings are not likely to persist when softened in so delightful a glow.

THE HISTORICAL AND GEOGRAPHICAL ATLASES

These are to contain any of the written work in history and geography that the teacher desires to collect in this way and preserve. The pupils will take more pains with work which is to be preserved thus, and will keep familiar with it longer.

For September the Atlases may contain copies of the dialogs that have been worked out in collaboration with the children, the map that Phemius drew in the sand, Ptolemy's map of the world, and papers on topics suggested by the teacher. Such topics may be:

How did men travel in the days of Odysseus?

What countries unknown to Phemius does Ptolemy's map show?

How did the Romans learn about these countries?

What products and industries did the Romans have that the Greeks of Homer's time did not have?

Write a diary of Leif's voyage, using Liljencrantz's book for suggestions.

What countries did the Crusaders see? What eastern products did they bring back with them?

Drawings without shading should be abundant. Make a picture of Phemius giving the little Odysseus his lesson in geography. Show Horatius at the bridge. Make sketches showing the Roman ships; the Roman soldiers; camels. Draw the viking "Griffin"; a crusader; etc. Tell the whole story of Horatius in pictures.

GRAMMAR

While correct English is to be learned by practice in hearing, speaking, reading and writing the language, correct English is to be understood by a reasonable study of English grammar. The work for the year is the structure of a simple sentence, including the use of the nine parts of speech, the terms subject, predicate, object complement, attribute complement, and objective complement, the use of the participle and the infinitive, the adjective and adverb phrases, the persons and tenses of the verb.

Do not work with definitions. Teach the children how to use the terms. When a pupil can understand a term and use it himself correctly, he knows it even if he cannot define it. Diagramming will be found very helpful if neatly done from the first.

In analyzing a sentence always begin with the verb, working from that to the subject and then the complement if there be one. Familiarize the children with the sentence in its simplest form, stripped of its modifiers. Teach the proper punctuation of the sentence as a sort of simple diagramming of it. Consider the order of words from the same point of view.

SPELLING

The main stress has to be laid on proper hearing of the word, distinct pronunciation of it, with every syllable as clear-cut as a new coin from the mint, and then the spelling of it, syllable by syllable. The idea that spelling is to be taught by writing the words is not wholly correct. Our miserably slovenly English pronunciation may to some extent be helped by teaching proper syllabification and distinct enunciation of each separate syllable. Most of the mistakes in spelling come from not knowing exactly what the word is in sound.

The word-method of teaching reading may be all right if not used too long. It is, however, quite time that children in the fifth grade should be using syllables and thereby gaining the advantages that come to a syllabic language in distinction from a language like the Chinese that has a separate character for every word.

Proper training in pronunciation, syllabification, and spelling syllable by syllable, will prepare the way for the easier understanding of etymology. Many of the common Greek and Latin roots may be studied this month and the succeeding, in connection with the Greek and Roman scenes acted out. Those words should be taken that connect with scenes in the dialog, e. g., *schola*, *pedagogos*, *tabula*, *geographia*, *ludus*, *calculus*, *stylus*, *magister literarum*, *puer*, *puella*, and the prefixes and suffixes coming mainly from the Latin prepositions.

Children who have not been referring to the dictionary will need some practice in arranging words alphabetically. All but the dullest will readily pick up the point in a few attempts, but some will need to be shown repeatedly and drilled on many words before they will be able to find a word reliably and promptly.

It is well to have dictation exercises often for all in the class,

but for some it should be daily. Let one of the abler pupils give the dictation to the small group of slower ones. Have the children help in looking over and marking the papers.

READING

I cannot see why a class of children should be made to sit with open books, following the text which one pupil reads aloud. The best results can come only when the natural stimulus to reading is provided, namely, a responsive and interested audience. Let there be only one book and that one in the hands of the reader. He is then responsible for what is in the book, and all will naturally attend to get the sense.

A fifth-grade pupil should be able to pronounce any new word as it is spelled, and hence be able to read uninterruptedly even at sight. If any of the new words be accented wrongly, the teacher may correct the mistake by telling the pupil which syllable to accent. Similarly, the length of vowel sounds may make help necessary.

Except very rarely, the teacher should not pronounce the word for the pupil. There should be daily practice in pronouncing according to direction, when told where to place the accent and what sound to give the vowels or the consonants. Of course, the main daily drill must be given to the division of words into syllables, if that has not yet been mastered.

Pupils need not make any exceptions to the rule to pronounce a single consonant with the following vowel; there are no exceptions that will bother them much. It is true this method of pronunciation is not always followed in the dictionary, because the dictionary allows other considerations, such as the length of the vowel, the accent, the etymology, etc., to modify the rule. But these variations would make the rule no rule at all to the pupil.

The best reading material will be dialogs, or graphic descriptions in which dialog is frequent. Introduce as much acting as possible, both for the sake of the interest and for the sake of naturalness of expression.

THE ARTS

MUSIC

USE the pitch-pipe in getting *do* of the different keys. Let the pupils sound *do* (upper C) first, and then sing down the scale and up again, then compare with the pitch of *do* from the pipe. This will gradually result in fixing the pitch of upper C permanently so that later the children will be independent of the pitch pipe. They should learn how to get *do* in any key from *do* in the key of C.

Teach the children to beat time, and also to keep time by unobtrusive movements, as of the toes inside the shoe. It will be found quite practicable to have the pupil chorister beat time with a wand for the singing of the choir.

For September teach "But the Lord is Mindful of His Own," from Mendelssohn's oratorio of "St. Paul," "There's Music in the Air," and "Just for To-day." Some of this will have to be done by rote, but the written music should be before the children, and they should read as far as possible. Take the drill exercises from the phrases of the song and variations; practice on the new points of difficulty contained in the songs, viz., the divided beat and the slur.

The pupils are expected to have learned, in the fourth year, to write all major scales. but they will need a great deal more practice to become thoroly familiar with the scales. Have daily drill on the signatures, and teach the signatures as parts of one system or series. Have every pupil familiar with the

letter series, F, C, G, D, A, E, B, so that he can repeat it backward (for the flats) or forward (for the sharps) as rapidly and as unerringly as the alphabet. Teach the relation of the key-note of each key to this series. Give written tests such as the following: "I am thinking of a key in which *mi* is on B; write its signature. I am thinking of a key in which *sol* is on F; write its signature and the notes 5, 5, 6, 5, 3, 2, 3, 1, 7, 6, 1, 6, 5, 4, 5, 3, 1."

Have considerable writing from dictation, so that the pupils will use the technical terms and hear them used, but avoid drilling them on definitions.

The pupils need systematic ear-training every day of the year. Test their recognition of melodies from hearing the opening phrase. In a written score omit several notes; then sing it over or play it over complete and have the pupils add the missing notes. Sing or play major and minor exercises for the children to distinguish by ear.

Singing will naturally accompany the opening and closing of school each day, will form part of the program of the Literary Society meetings, and will be a feature of other special occasions. It has been our experience that choir work greatly helps the singing by providing fresh songs for the exercises Friday afternoon, by giving more individual work in a smaller group, and by providing the opportunity for extra voluntary work.

Every day a few minutes should be given to drill on the scale, including intervals of increasing difficulty, modulations, singing the syllable names to the written music, and a few minutes to written work and to oral questioning.

Give particular attention to distinct pronunciation in singing. It will help both the singing and the reading. Immobility of the lips is an exceedingly common fault, accompanying flat, smothered tones.

Allow no strained singing. Sweet tones are soft, but may be full of sound.

Most of these directions for September apply to all the succeeding months as well, since such drills on intervals, scale, terms, distinctness, and ear-training must be continued thruout the year.

PENMANSHIP

The drill in penmanship will count for more between the ages of ten and twelve or thirteen than at any other time. If correct habits of posture, holding the pen, and shaping the letters with uniformity of height and direction, are now formed, they will be likely to last through life. It is folly to spread this gymnastic drill thinly over a long period. It must be mastered at once by persistent, intensive drill periods.

Of course this will take several months, but keep at it every day. Cet the habits thoroly fixed before relaxing any, either in quantity or in quality. Later it will do to depend for practice on the necessary written work of the other periods. Now is the time for practice on the double-ruled paper to gain uniformity in the height of letters.

Avoid having the capitals made of the same shape as the small letters, and do not permit the joining of capitals to the small letters in writing. This leads to neglect and indifference in the matter of capitalization. Unruled tablets should be used to get the children used to writing without lines.

DRAWING AND PAINTING

Everyone can learn to draw. Practice is all that is required. If one got as much practice in drawing as he gets in talking, he would draw as readily as he talks. Drawing is one of the great means of expression, and should be developed in each pupil for the purpose of expression. Rapid sketching should be the chief

form of drawing in school. It should supplement the language work in every subject — geography, history, arithmetic, nature study, and literature. The pupils should answer questions by drawing as much as by talking.

Should there be a separate drawing period? Yes. Just as there should be a separate language period, so there should be a separate drawing period, in which the technique receives systematic attention. But success in teaching drawing does not depend on technique one-tenth so much as it depends on practice. If pupils are not drawing every day in every period and out of school from liking, they will not have practice enough to form the drawing habit.

Aim at simplicity in representation by using the very fewest lines possible. Avoid shading until form is well mastered. Study Phil May's Sketch Book, Augsburg's Drawing Books, J. Liberty Tadd's great book on "New Methods in Education."

Do not waste time in drawing cubes and spheres or other type solids. Draw everything you want to draw. Form the habit of wanting to draw. Always have paper and pencil with you and sketch while waiting for a train, while resting on a picnic, while riding or even while walking, while studying, and above all while *teaching*. Talk and draw at the same time and get your pupils to do this. Just as talking has developed thought, so drawing, when practiced sufficiently, will develop observation.

MAKING

While the interest in birds is keenest, thru the appreciation of their help in destroying insects, the children should begin to make bird-houses for the coming spring. Let the ants' nest for special use in February be prepared now and the ant colony settled.

Each pupil should make a clock face with movable hands to

use in learning to tell time readily in the problems of length of day and length of night, difference of time, and addition of time.

Fraction squares, such as those on page 166 of Southworth-Stone Arithmetic, Book I, should be drawn large.

The map that Phemius drew in the sand should be drawn on the ground in an open-air session of the geography class.

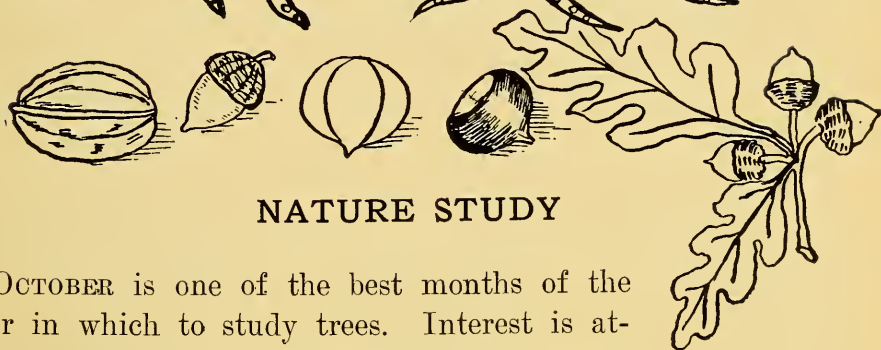
Have the children make a small viking ship with carved prow and with rigging as shown in the pictures in the history books.

Numerous utensils to be used in the acting out of "The Golden Age," "Julius Cæsar," and "The Thrall of Lief the Lucky" will be needed.



AFTER SCHOOL

OCTOBER



NATURE STUDY

OCTOBER is one of the best months of the year in which to study trees. Interest is attracted to them by their falling leaves, their changing hues, the ripening nuts, the uncovered nests, and the preparation for winter. It is these autumn aspects of trees that we propose to study in October.

Lead children to appreciate and love trees. Trees are of universal importance and interest. They exert an influence of untold value, and are generally available for study in every locality. We are indebted to them in numberless ways for many of the comforts and luxuries of life. The varied forms and colors have a great attraction for children, and they should be taught to know and love the trees.

Make a large map of your neighborhood, showing streets, houses, farms, fields, roads, lanes, creeks, etc.; then have all the trees of the neighborhood charted on the map. Different colors may be used to indicate different kinds of trees. The leaves will be the readiest means of identifying the species, and will be brought in daily by the pupils. The teacher should lead

the pupils to associate other characteristics of bark, branching, and buds with the leaves, so that as the leaves fall the trees may still be identified.

Do not depend on word descriptions, but have leaves and branching so well drawn that the characteristics show of themselves. Bring in leafless branches of different trees and have the pupils identify them. These forms must become so familiar to the pupils that characteristic leaves, branching, bark, and buds of any of the common species of native trees can be readily drawn from memory. The following books will be found useful:

Among Green Trees,
Trees of the Northern
United States,
Our Native Trees,
The Trees of Northeast-
ern America,
Familiar Trees and their
Leaves,
A Primer of Forestry,

Julia Ellen Rogers,
Austin C. Appgar,
Harriet L. Keeler,
Chas. S. Newhall,
F. Schuyler Mathews,
Gifford Pinchot,

A. W. Mumford, Chicago.
American Book Co.
Scribner.
Putnams.
D. Appleton & Co.
U. S. Dept. of Agriculture

It may also be well to make a more detailed study of a particular kind of tree, or even of one individual tree at the corner of the schoolhouse. We study the lower animals and plants too much as general notions instead of as individual existences. Thompson-Seton and William J. Long have done well to show us the individuality of animals. Every lover of horses, dogs or birds knows that the animals differ, and that it is the individual characteristics that attract or repel interest and friendship.

Should not we similarly try to individualize the life of some particular oak tree, for instance, in order the more fully to study its concrete life? Name the tree, as has been done with several of the Big Trees of California, e. g., Wawonah, Grizzly Giant, etc. Collect data for its biography; trace the scars of its wounds from frost, from claws, from axes, from insects, from lightning; note the postures of the branches from the winds of years; trace

its chronicle of years in the annual leaf scars on its branches; test its appetite and thirst with fertilizers and moisture supply; note its different branching and trace the causes; take its measurements and record its growth.

Note the animal life that it supports — insects, birds, squirrels. Note how this animal life reacts on the life of the tree. The bird inhabitants have come for the insects which would have devoured the tree. The squirrels eat some nuts, but store up others of which some will germinate and thus spread the descendants of the tree.

Note its seed-years.

Having made friends with the tree, keep up your speaking acquaintance thru succeeding years. Help to spread its progeny by planting the acorns and guarding and shielding the young seedlings. Tree-planting is educational. Read Thompson-Seton's "Stories on the Tree Trunks," in *Country Life in America* for May, 1904. See, also, "How to Draw a Tree," *ibid*; H. Marshall Ward's "The Oak," D. Appleton & Co., publishers; and "The Population of an Old Pear Tree," published by Macmillan.

The school garden will be ending its fruitage for the season. The flowers will in some cases need to be taken up for the winter and placed in the window-gardens in the schoolrooms.

WEATHER RECORD

If the children have been tracing the progress of High and Low across the country on their blank weather maps (see p. 29), they will now be ready to see why the winds blow toward the Low and away from the High. They should mark the wind directions by means of small arrows on their blank maps and realize the whirling motion centering about each High and Low.

By comparison of the prevailing wind directions on successive

days at any one place the regular causes for the usual changes in the wind directions may be made clear. Each day the pupils should be drilled to think of the position of High and Low in direction and distance from home, and to point in the direction, and state the distance and locality.

In connection with the wind it would be well to study the subject of ventilation, which is governed by precisely the same principles. Draw a plan of the room and chart all the chief currents, drafts and vents, and hang thermometers in different places to record the temperature of the air. It will be readily possible to trace the causes of the air movements.

Teach the importance of full, deep breathing. Shallow breathers only half live. Have breathing exercises every day, till the habit of deep breathing is formed. Test progress with the home-made lung tester.

GEOGRAPHY

WE STUDY the trade routes of the Middle Ages to India and the East. The possibility of reaching India by other routes and the necessity of finding another route in the fifteenth century should be discussed on the basis of Ptolemy's Map of the World. The question of whether a route around Africa was feasible should be discussed with fifteenth century arguments and difficulties in mind.

This is the place to treat the proofs that the earth is round. Take them historically. Do not stuff the children nor allow them to prejudge the whole matter by assuming that the world is round and therefore that it requires no proof — that it was absurd for any person ever to doubt that it was round.

With the rotundity of the earth in mind the subject of latitude and longitude will be clearer, and it will in its turn reinforce the conception of the roundness of the earth. Have a

good-sized rubber ball for each pupil, and let the joint between the two halves represent the equator. Meridians and parallels may be drawn with lead pencil. Then mark the starting meridian and locate coast points in Europe and Africa and India by means of their latitude and longitude. Then draw the coast line. Now locate the route around Africa and describe it in terms of latitude and longitude.

Make a simple astrolabe by suspending a plumb-bob from the circle center of a quadrant graduated to degrees. Sight along the straight edge and take the reading in degrees for the altitude. In this way take the altitude of the North Star. This will be the same as the latitude of the place of observation.

The calculation of longitude can be readily illustrated by setting a watch to Greenwich time and then taking an observation on the sun to determine when it crosses the meridian. Multiply the time past noon at Greenwich by fifteen and you will obtain the longitude of the point of observation in degrees, minutes, and seconds.

In the fifteenth century it was the custom of navigators to sail due north or south to the parallel of their proposed destination and then shape their course directly east or west. This is why Columbus sailed to the Canaries in 1492, and then due west for Chipangu.

Now is the time for a full and painstaking comparison between the Northern and the Southern Hemispheres. As we go north from the equator the maximal altitude of the sun above the horizon becomes less, and noon shadows become longer and longer; the climate grows cooler; the variation in the length of the days from summer to winter becomes greater; the sun rises farther and farther to the north of east in June; the distinction of the four seasons becomes gradually greater; we pass from a tropical region of calms to a region of trade winds, then to the horse latitudes in the Calms of Cancer, then to the tem-



THE HEMISPHERE MODEL IN THE NORTH CORNER

perate region of prevailing westerlies, and finally reach the frigid region of occasional northeasterlies.

Trace the corresponding changes as we go southward from the equatorial heat belt. What date is it now in South Africa? What season is it there? What season will it be there at Christmas time? At Easter? Make out a calendar of the seasons for the Cape of Good Hope. Compare the harvest of the regions in the Northern Hemisphere with the harvests of the regions in the Southern Hemisphere for the same dates. For the purpose

consult the Monthly Harvest Calendar in the *Little Chronicle*. Recall the calendar of the world's harvests from month to month in "The Fourth School Year."

In what direction does the shadow of the sun extend here at home in the morning, at noon, at evening? In what direction does the shadow of the sun extend in South Africa in the morning, at noon, at evening? Draw the Southern Hemisphere on the outside of a wooden butter bowl, keeping the South Pole uppermost and resting the rim (the equator) on the table. Get used to having the south end of the world uppermost. Many of the very difficulties the pupils will thus meet and understand are those that confused the sailors, geographers, and monks of the time of Prince Henry and Columbus.

HISTORY AND LITERATURE

READ the Sinbad stories to get the way the people of Europe regarded India and the East. These stories give in the main a true picture of life in the East. Where they are exaggerations they are true to the spirit of eastern fancy, but even the roc and the mares and the river that flows inland are almost literally true. The Old Man of the Sea is a good temperance lesson. Marco Polo found the Valley of Diamonds, and was struck on the head by a cocoanut thrown by a monkey in the top of a palm-tree.

Study the travels of Marco Polo with a good deal of detail, using Towle's or Yule's Marco Polo or some equally full and interesting account. On a large rubber ball draw the known world of the thirteenth century and mark in heavy line the route of Marco Polo to Cambaluc, his journeys as ambassador of the Great Khan, and his homeward route. He was one of the greatest travelers of all time. His book "contributed more

new facts toward a knowledge of the earth's surface than any book that had ever been written before." *

The Return of Marco Polo in 1295 A. D. has been acted out in somewhat the following form by fifth-grade pupils:

SCENE I

The exterior of a house in Venice. MARCO POLO, his FATHER, and UNCLE, in Chinese garb, approach and, after much looking about, begin to knock at the door of a house.

Marco. This does not look much like the place in which we lived twenty-four years ago. That shop did not use to be there.

Nicolo. No, that is so. Are we not in the wrong street? Is this San Giovanni? Let us inquire in this shop.

Maffeo. I would go in and ask, but I am afraid I have forgotten my Italiano.— Oh, here comes a woman. It will be easier to ask her. [*As a woman passes by*] Signorina, can you tell us where Casa Polo is?

Woman. Indeed, signor, yonder is Casa Polo — next to Casa Bianca.

Nicolo. Where did Messer Nicolo Polo use to live?

Woman. Young Messer Nicolo has always lived in yonder house, signor.

[*The woman passes on. MARCO knocks again. The door of the house is opened and a girl puts her head out.*]

Nicolo. Ah, is this Casa Polo?

Tessa. Yes, Signor Polo lives here.

Nicolo. Present our compliments and tell him that Maffeo Polo, Nicolo Polo, and Marco Polo are returned to greet him.

Tessa. Alas, signore, Messer Maffeo went on a hunting trip this morning and will be away the rest of the week. Messer

* Fiske's "Discovery of America," Vol. I, Chap. III.

Nicolo and the bambino are at home. I might like your joke better if I understood it.

Marco. We are not joking. We left home twenty-four years ago to travel to Cathay, and have now returned. This is our home.

Tessa. Wait, I'll call the butler. [They enter the house.]

SCENE II

Interior courtyard of Casa Polo. TESSA opens the door and admits the travelers. From the other side of the piazza come BEATRICE with her baby, several old women, and the butler. Presently, YOUNG NICOLO enters.

Marco. [Addressing the butler.] Do you know Nicolo Polo? Maffeo Polo, and Marco Polo?

Butler. [Gruffly] Yes, I know them well. Messer Nicolo is just coming out of yonder doorway. Messer Maffeo is off on a hunt in the forest of Cortuna, and Marco — bless his heart! — that is the heir of the Polos over there in his mother's arms.

Nicolo. [Laughing] Is it I coming out of that doorway? Mark, there are two of you, too; we're duplicated! [Addressing BEATRICE] Pardon me, signora mia, may I ask your name?

Beatrice. [As the baby begins to cry] Hush, Mark, the Chinesers won't hurt you. Your grandpa used to live with them. [Looking up] Signor, my name is Beatrice Polo.

Nicolo. That was your mother's name, Marco.

Maffeo. Brother, this is stranger than Cathay. Who is the father of that darling bambino?

Young Nicolo. [Stepping forward] I am, signor.

Maffeo. What is your father's name?

Young Nicolo. Maffeo Polo.

Nicolo. Are not any of you old enough to remember the

Polos who twenty-four years ago set out from here to travel to far Cathay?

[An old woman elbows her way forward and then stands, with her arms akimbo, staring at the strangers.]



MARCO POLO'S RETURN TO VENICE — SCENE I

Old Woman. I remember them well, but I do not know you. The Polos were killed in Cathay a dozen years ago.

Butler. Pooh! pooh! we know you not! You are a set of impostors. You must leave this house.

Marco. Hold on! Father, I believe this signor is my brother Maffeo's son, and that bambino is your great-grandchild.

Maffeo. Then, it is my nephew that is hunting in Cortuna?

Nicolo. [*To YOUNG NICOLO and BEATRICE*] And you are my grandchildren.

[*YOUNG NICOLO and BEATRICE laugh as tho they did not believe it.*]

Young Nicolo. Well, it may be so; but we have never seen you before. Tell us of your travels; that will prove your story.

Nicolo. Very well, good people, we shall soon persuade you then. We will tell our story.

[*The company find seats.*]

Maffeo. We set out from Venice one bright morning in April, 1271, little thinking how long it would be before we saw home again. We went by ship to Acre in the Holy Land, thence by camels overland to Bagdad, and took ship at Bussora, whence Sinbad the Sailor used to sail on his famous voyages. In a storm our ship was damaged and we put in at Hormuz at the mouth of the Persian Gulf. From here we traveled slowly overland thru Persia, and thence eastward thru Tartary and the Great Desert of Lop into northeastern Cathay.

Young Nicolo. Had you not been there once before? Did the emperor recognize you from your former visit?

Nicolo. He did, indeed; he was expecting us. When we were within three days' journey of the royal palace, we stopped and sent forward a messenger to Kublai Khan, to inform him of our coming, and then we waited there for his reply. Within a week our messenger returned with a large cavalcade sent by the Khan to escort us to his palace. We hastened on our way, and on the third day came to the royal hunting-grounds and saw the palace in the distance. A great multitude of horsemen were coming toward us, and soon we saw among them a huge elephant on whose back appeared a glittering canopy of silk and

gold. The Great Khan himself was coming out to welcome us. "Good Venetians," he said, "I am filled with joy to see you. Welcome back to Cathay. You have kept your promise to return."

Marco. But he had not seen me before, and he asked my father who I was. "Sire," replied my father, "he is your majesty's servant, my son." After that the Khan welcomed me cordially.

Nicolo. Yes, Kublai Khan valued the services of my son Marco more than those of any other ambassador at his court.

Beatrice. How long did it take you to learn Chinese?

Marco. Oh, father and uncle had learned it on their former visit. I picked it up in two or three months so that I could talk it a little and read some. See, this is the way they write [*Shows books and writes on board*]. These are their figures [*Writing them down*].

[*A short Chinese verse may be recited as a sample of the language.*]

Young Nicolo. I believe what you are telling me, uncle, more from your manner than from the facts I have heard. Grandfather, pardon me for not welcoming you at first more heartily to your own house. [*They embrace.*]

Fanita. Have you brought with you any of those silks and diamonds that Sinbad tells us about?

Maffeo. Yes, cara mia, we have trunks full of them. But good folks, I propose that we invite our old-time friends to a banquet to-morrow evening to celebrate our home-coming, and then we can convince them all at once that we speak truth.

Nicolo. That would be well.

Young Nicolo. With all my heart. Everything we can do shall be cheerfully done for our most illustrious merchant princes. [*To the butler*] Show these signors to the guest chambers and give them every attention.

SCENE III

Banquet Hall of Casa Polo. Enter NICOLO, with BEATRICE on his arm; DUKE GRATIANO with FANITA; MARCO with JULIA; COUNT CRISTO with MARGHERITA; MAFFEO with DONNA TORZA; LORENZO MATTHEA with MARIA DEI CONTI; YOUNG NICOLO with the DUCHESS OF URBINO.

Beatrice. Be seated, friends.

Gratiano. I do declare, noble Nicolo, I would never have believed that it was you come back to Venice, after twenty-four years of absence if you had not been able to tell me all about that day twenty-six years ago when you had just returned from your former journey.

Margherita. My dear signor, you are changed entirely. Excuse me for saying it, but, Signor Polo, you have become half Chinese. That pigtail looks like the genuine article. You used to have a fine long beard. You have a foreign accent, and your words do not sound like good Italian any more. Signor, can you say, "Il rege" ?

Nicolo. Il lege. [*The company laugh.*]

Margherita. Yes!

Nicolo. Is not that natulul? We thlee have spokee the dozen diffelent languages of Asia in the countlies we have lived in. We have heard no Italiano since we left Jelusalem, twenty-four years ago last month.

Cristo. How long did it take you to return from Cambaluc, Messer Polo?

Maffeo. We have been thlee years on the way. We coasted all along the eastern and southern shore of Asia.

Gratiano. Then is Ptolemy's map of the world wrong? Are you sure of the route you returned by?

Cristo. I hesitate to believe that the great Ptolemy, who has been followed for a thousand years, can be wrong.

Marco. [*Rising to address them*] There can be no doubt of an ocean sea to the east of Cathay. [*Shows map and points out on it the route they came.**] The Chinese call this sea the Sea of Chin. Chipangu lies five hundred miles off the coast of Cathay, in that broad ocean. It has immense riches in gold. The Mikado's palace is paved with bricks of shining gold, two fingers' breadth in thickness. The Spice Islands lie to the southeast and are of surpassing wealth, producing pepper, nutmegs, cubebs, cloves, and spikenard, and all other kinds of spices. [*He continues to point out the route.*] The annual revenues of the Great Khan are seventy-five to one hundred millions in gold. But the Mikado of Chipangu has never counted the millions of his wealth.

Julia. Well, well, "Marco Millions," did not the Great Khan part with you reluctantly? I suppose you were so useful to him that he gave you of his millions.

Nicolo. He would not have let us go at all, if the royal bride for the Khan of Persia had not been needing safe escort to her new home. There was war in the west of Cathay, and so Cocachin could not travel overland, but had to go by sea. Kublai Khan knew of our skill with ships, and intrusted her to us. Marco had already sailed thru the Indian Ocean on one of his embassies for the Great Khan.

Margherita. So he parted with you in order that he might send Cocachin safely to her intended husband.

Marco. Yes. When we arrived in the Persian Gulf, however, we learned that the old King of Persia was dead. We had never dreamed of that possibility, and we did not know what to do.

Fanita. What did you do? You might have brought her along home and we could have adopted her into the family.

* See Chapter XIV in "Towle's Marco Polo," and improvise here. The guests should ask questions freely for the Polos to answer.

Nicolo. Oh, you do not know the pride of an eastern princess! The new king, Casan, who succeeded the dead Khan, was already looking for a bride, and the young people quickly arranged the matter by becoming engaged. So we were relieved, and made our way home.

Beatrice. I think the ladies might now withdraw and leave the gentlemen to themselves. [*Ladies go out.*]

Nicolo. [*As MARCO starts for the door*] Bring in the baggage, Mark. [*Exit MARCO. Returns with several bundles.*]

Nicolo. [*After opening up a bundle*] Now, friends, these rich clothes that we have brought —

Gratiano. [*Interrupting*] They look like old duds, fit for the rag-picker.

Nicolo. They may seem so outwardly. [*Laughs and looks at MARCO with a wink, and proceeds to rip open the seams and to bring forth diamonds, rubies, etc.*]

Gratiano. [*Examining the jewels as they are laid out on the table*] Oh, my eyes! where did you get such treasures? By San Marco! I have never before seen such stones in Venice!

Nicolo. [*Continuing to take out more brilliants and gold ornaments*] There have never before been such in Europe.

Cristo. Santa Maria! that diamond must be worth twenty thousand pounds sterling at least. Is it not?

Maffeo. Fifty thousand pounds, my good friend. The Great Khan gave Marco that diamond for performing a most difficult mission in the northern part of the Empire.

Lorenzo. What is there north of Cathay? What sort of a place is it?

Marcò. They call it the Land of Darkness. Sometimes the merchants speak of it as the Land of Furs. The trade is chiefly in furs. It is a cold, bleak country.

Young Nicolo. Do the Chinamen know more about anything than we do? Were you able to learn anything from them?

Marco. Yes, indeed; for one thing, they burn a kind of black stone for fuel, instead of wood.

Nicolo. In directing their junks, they make use of a magnetic needle that they have mounted in a box. This needle always points north. Here I have one that I brought with me. We used this needle on the voyage home. [*He shows the compass and explains it.*]

[*Here let the actors improvise questions and answers.*]

Nicolo. They have a wonderful powder, too, that explodes fearfully, with awful force. They declare they invented it many, many years ago. They use it for fireworks. They send up sky-rockets [*Imitates the noise of a skyrocket whizzing upward and then exploding and falling*] that explode in the air like shooting stars.

[*While the men are talking about the compass and gunpowder, TESSA slips in and carries out the old coats that are lying in a heap on the floor.*]

Maffeo. Kublai Khan's grandfather, Jenghiz Khan, who led the Mongolian invasion of Cathay, in the early part of this century, used this explosive powder to fire great guns in battle with the Chinese. One of his big guns would throw an iron ball weighing a pound a distance of over a mile. It was one means of his success. He conquered all Cathay and established his dynasty on the throne of the Flowery Kingdom.

Marco. [*Noticing that the coats are missing*] Why, father, where are our diamonds and all our millions? Who took those coats? [*He rushes out, calling thru the house. Presently he returns with Tessa and the ladies.*]

Tessa. Why, an old ragman, Gobbo, came along just now and asked if we had any old rags to sell. I thought of those old rags of coats you had thrown on the floor. I heard you say you were rich; and I thought I would just get rid of the old truck at once. It would only have bred moths and been in the

way, as you would never have worn those rags any more; Gobbo gave me twenty-five centesimi for the whole lot. Mighty glad I was to be rid of it all, too.

Cristo, Gratiano and Young Nicolo. [*Talking all at once and crowding around Tessa*] You have lost millions! There were diamonds in those rags! The wealth of the Polos was sewed up in those old duds! Can't you call Gobbo back? Do not you know where the fellow's shop is? [*Marco again rushes out.*]

Nicolo. [*Calmly*] Good friends! Sweet friends! There is no need of anxiety. We have still other millions in the other boxes.

The Company. What marvelous wealth!

Marco. [*Returning*] I cannot see any sign of Gobbo. Perchance he will never return.

Young Nicolo. To-morrow, Tessa, you must take your stand on the Rialto, over the Grand Canal, and watch the crowd as they go across. If old Gobbo should pass by, you must recognize those coats and buy them back from him. Perhaps he will not yet have found the jewels sewed up in the lining.

Maffeo. We have saved a few millions here, and have a dozen more boxes of silks and rubies. The wealth of the East is not exhausted.

Gratiano. You have certainly proved that you are the Polos of Venice, the greatest merchant travelers of the world.

The Company. Long life to Messer Nicolo, Messer Maffeo and Messer Marco Polo! [*Exeunt all but NICOLO.*]

Piccolo. [*Rushing in*] I know Gobbo. I saw him on the corner of San Marco just now. He had those old clothes with him. I will go and buy them back. Give me a lira. [*He gets it and departs. Exit NICOLO.*]

Treat briefly the onward career of the beastly Turk after the times of the Crusades down to the capture of Constantinople

in 1453. Realize the result as they strangled the trade by the Black Sea Route, and swept on thru Syria and down toward Egypt, cutting off access to the Persian Gulf and the Red Sea. Moreover, the eastern waters of the Mediterranean Sea began to swarm with Turkish corsairs that plundered and murdered whenever they came up with a Christian merchantman.

The more completely the eastern Mediterranean was thus



THE COUNCIL OF SALAMANCA

closed to the trade with India, the stronger grew the impulse to find "an outside route to the Indies." The first attempt was naturally made by Portugal by way of the route around Africa. Contrast the continental theory of Ptolemy with the oceanic theory of Mela. (See maps in Fiske's "School History of the United States," pp. 24, 25.) Which was the hopeful theory?

Tell of the "fiery zone" and the imagined impossibility of crossing it; the fancied danger of sailing "down-hill"; the

superstitious fears of the "gorgons and hydras and chimæras dire" inhabiting the unexplored regions; the shuddering dread with which the Sea of Darkness and the edge of the world were regarded. Contrast briefly the Mediterranean Period in history with the Atlantic Period that began with Prince Henry and involved all the Atlantic nations of Europe.

Give the main epochs of Prince Henry's life; the capture of Ceuta; expeditions to the Guinea coast for gold; visions of an ocean route to India. His motives were desire for trade, extension of Portugal's dominion, and the converting of the heathen races. He refused all offers of military honors, and retired to the lonely and barren rock of Sagres, there, on the supposed most western corner of Europe, to build an astronomical observatory, and to gather about him men competent to teach and eager to learn the mysteries of map-making and the art of navigation. Follow the Portuguese discoveries by the map in Fiske's "Discovery of America" (Vol. I, Chap. IV).

The voyage of Dias brought the work of Prince Henry to a glorious climax at the same time that it proved the desirability of a shorter route. On the first ship that doubled the Cape of Good Hope was Bartholomew Columbus. Christopher Columbus had been on other voyages along the African Coast. It was his genius and his daring that first put to a test the theory of the roundness of the earth and realized the dream of sailing west to reach the east.

Take George Lansing Raymond's drama of "Columbus" as the material for the life of the great discoverer. It would be well to saturate the children with the spirit of this play every day for three or four weeks. Subordinate everything else for the time being to Columbus. The home life of Columbus, his difficulties in securing help, the Council of Salamanca, the scene at La Rabida, the preparations at Palos and the departure, the mutiny, the midnight discovery of land and the morning ap-

proach to it, the return home and reception at the court, the egg story, Columbus in chains in Hispaniola, and his death in Spain, are here told in the live form of dialog and acting.

Columbus on his second voyage, Pinzon with Americus Vesputius, and Cabot on the Labrador coast found this "Asia" very different from the Asia described by Marco Polo. The western route failed to reach the riches of India, altho nobody, apparently, thought that Asia had not been reached.

Meanwhile the Portuguese took heart again and tried their route. Vasco da Gama started from Lisbon in 1497, sailed around the Cape of Good Hope to the Coast of Hindustan, and returned in the summer of 1499, with his ships laden with the genuine Sinbad articles — pepper and spices, rubies and diamonds, emeralds, silks and satins, ivory and bronzes.

Columbus was discredited, and returned to seek for a strait thru from the Atlantic Ocean to the Indian Ocean. If Columbus could have known that there was a continuous continent of which he had never heard stretching from the frigid north to the frigid south, and that he was still farther from India than the entire length of the Portuguese route around Africa, what bitter disappointment would have been added to his last days!

NUMBER

THE work just outlined makes necessary the study of the sphere. Learn the dimensions of the earth and compare them with Toscanelli's estimates. Calculate the earth's circumference, the length of the quadrant from the pole to the equator, the length of a degree in miles on a meridian, the area of the earth's surface, etc. Find why the length of a degree on a parallel grows less as we approach the poles. Show the method of reckoning longitude by chronometer time of Greenwich (see p. 61).

Nearly all the difficulties of longitude and time may be overcome by the use of demonstration material. Make for use in your classroom such a piece of apparatus as that shown in the figure on page 79.

The central part, consisting of the northern hemisphere with a circular disk of cardboard attached to it, is movable and can be turned from right to left to represent the earth's rotation from west to east. The immovable ring beyond the outer margin of this disk is divided into twenty-four equal parts corresponding to the twenty-four hours of the day. The arrow at the top of the chart shows the direction of the sun's rays and points to the noon hour. The afternoon hours follow to the left, and the evening hours extend below, where the darker night sky is seen with the Great Dipper on the left and the crescent moon on the right. Midnight is represented at the bottom of the chart and is followed by the early morning and forenoon hours upward to XII again. The purpose of the circular disk of cardboard attached to the wooden hemisphere in the center is simply to afford space on which to write the geographical names large enough to be seen across the room. The names are written on the radiating lines extending from the meridians of the places on the hemisphere. The black line extending vertically across the hemisphere represents the prime meridian of Greenwich. The somewhat irregular dotted line shows the position of the international date line.

The photograph shows the apparatus set for noon at Greenwich. The local time of every other place can be read off by simply following its meridian down to the equator on the wooden hemisphere and outward on the cardboard disk to the ring of the hours. It is, however, more than a calculating machine, for it also shows the reason for its answer. The world really turns thru the hours, as the model turns thru its hour circle. If our clock faces were arranged with twenty-four hours instead of

twelve, we should have a good model of the daily motion of the earth constantly before us. The changing position of the hour hand would then correspond to the changing direction of the vertical position of a man during every portion of the twenty-four hours.

What time is it at Bagdad, when it is half-past nine o'clock in the morning at Philadelphia? Turn the hemisphere from right to left until the meridian of Philadelphia is brought opposite to 9:30 A. M. By looking now at the meridian of Bagdad we see it is opposite 5:30 P. M. Of course we have not only the local time at Bagdad before us, but we can equally well read off the time it is at any other place at that moment. For instance, it is ten minutes after midnight in the morning of the following day at Melbourne.

The international date line is marked on the wooden hemisphere. As the hemisphere turns from west to east all meridians are in succession brought opposite the hour of midnight at the bottom of the chart. The day begins first at the international date line, and begins later and later for all other meridians in proportion to their distance west from the 180th. The less their longitude east or the greater their longitude west, the later does the day begin. The new century began first, therefore, in that place which is nearest to the international date line but west of it. In the northern hemisphere this place is the eastern extremity of Siberia, but the Russians use the Julian calendar and are therefore behind. In the southern hemisphere the century began first on the Friendly Islands, which are included in the Australian day. As some of them are as much as 174 degrees west longitude, January 1st began twenty-four minutes sooner there than at the meridian of 180 degrees, or, seventeen hours and twenty-four minutes before the century began at Philadelphia, Pa. The position of the international date line is marked on the movable disk by a star (*) and the letter "A"



LATITUDE AND LONGITUDE APPARATUS

(antipodes). As this point turns past the hour of midnight, we have represented before us between this point (A) and the hour of XII (at the bottom of the chart) all those places on the earth that already have the new day; whereas all the remaining meridians have still the previous day.

The daily motion of the earth on its axis is represented by the complete rotation of the hemisphere from west to east.

The use of the piece of apparatus in class has still further impressed me with the importance of actual models in teaching the fundamental conceptions of geography. The use of flat maps is very objectionable; and the use of Mercator's Projection is calculated to instill wrong conceptions that will never be overcome. The chief difficulties come from our awkward and distorted diagrams, or, worse still, from teaching by mere words. Sense-impression is the beginning of all knowledge.

On the large globe, fifty inches in diameter, calculate the scale (one hundred and sixty miles to the inch). Now, with tape line, measure distances on ocean routes in inches and calculate distances in miles, as, for example, from Lisbon to Cape Bojador, to the Cape of Good Hope, to Calcutta; from Palos to the Canaries and thence to San Salvador; from Venice to India by the Red Sea route; from Genoa to India by the Black Sea route; etc.

Calculate the size of the home town represented to scale on the map. Measure the thickness of one-hundred and sixty leaves of an ordinary book, and compare the scale length of a mile on the globe with the thickness of two leaves of the book. If there were people of the scale size on the model, would they be visible at all to the naked eye? If we make a paper caravel, one inch long, to sail the Atlantic on the fifty-inch globe, what actual length would this paper ship represent by scale? How many times too large would this representation be?

Continue this drill until the size of the earth is realized in

figures, and until the exercise itself no longer presents any difficulty. For further drill and its importance see the directions for September.

LANGUAGE

THE abundance of reference material and literature suggested for October will make the need of condensation keenly felt. This is what the pupils need. Train them to say as much as possible in the fewest words. Make the language lessons definitely aim at this, and have daily reports of the substance of stories read, news items, poems, paragraphs in the text-books, topics assigned to be looked up in reference books, etc.

Paraphrase is not wanted but the gist in the fewest words possible. I know of no better exercise to form a concise, vigorous style in writing than the attempt to condense good authors. For example, use Fiske's account of Marco Polo or of Prince Henry. Have the pupils give condensed accounts of the Sinbad voyages.

For October the Atlases may contain the map of the world as known in the time of Marco Polo, the map of the Portuguese discoveries on the route around Africa, the map of Columbus's first voyage, the pupil's condensed account of Marco Polo and of Prince Henry and his work, the condensed Sinbad voyages, a concise life of Columbus, and papers on such topics as the following:

How did men travel in the days of Marco Polo?

What improvements had been made since the time of Ptolemy?

Of what countries unknown to Ptolemy had Marco Polo certain knowledge? *

What trade and what industries were stimulated by the travels of the Polos?

* See Fiske's summary in his "Discovery of America," Vol. I, Chap. III.

Why were Italian navigators very prominent later, in Portuguese and Spanish discoveries?

Fill the papers with illustrations; show Chinese pagodas and costumes, the Great Khan, elephants, junks, city walls, Turks, Prince Henry, a printing press, Constantinople, caravels of the fifteenth century, the compass, an astrolabe, Columbus, scenes from his life as presented in the play, etc.

Make a SEASON CHART for the northern and southern hemispheres of the following form:

SPRING			SUMMER			AUTUMN			WINTER		
MAR	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.
1			2			3			4		
THE			EQUATORIAL			HEAT BELT					
5			6			7			8		
MAR	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.
AUTUMN			WINTER			SPRING			SUMMER		

In the blank spaces, 1 to 8, draw, paint, or paste pictures typical of the seasons north and south of the equator. Fill in the equatorial heat belt with characteristic pictures of the tropics.

GRAMMAR

Remember that in grammar we are working with words, and that for the sake of clear thought it is necessary to have the pupils realize this. Hence, instead of saying that the subject

is "Columbus," or the attribute complement is "successful," have the full statement, "the subject is the noun, Columbus; the adjective, successful, is the attribute complement." One of the first difficulties in teaching formal grammar is the confusion of the thought with the thought-symbol; hence use every device that will aid in early making the distinction.

Train the children to think and state, first, the use of the word in the sentence, telling what word it modifies, or what its construction is, and then, secondly, the name of the part of speech that it is. The reverse order leads to guessing.

Continue the September work in the drill as above on the parts of speech. Include for October the teaching of the attribute complement. Compare it with the object complement. How do they differ? Compare it with an attributive adjective.

SPELLING

Continue the study of Latin roots in English words, especially such as connect with the references to the Latin countries, Italy, Spain and Portugal; e. g., *Mediterranean, navigate, continent, peninsula, native, mariner, diameter, circumference*, etc.

Select the misspelled words from all the written work and drill on these words that need it. Try to form the dictionary habit, i. e., the habit of using the dictionary whenever in doubt. This will serve to distinguish sharply between knowing and guessing.

READING

The teacher should read to the pupils frequently, but the pupils should have daily practice. The better readers may read to the whole class, but the poorer readers should have separate drill without wasting the time of the abler pupils.

Portions of Fiske's "Discovery of America," the whole of

the Sinbad stories, and of course all the material for dialogs should be read in this way. Practice should also be given in reading one's own composition, as in reporting on reference work, also in reading and writing connected equations that represent sentences in arithmetic.

THE ARTS

MUSIC

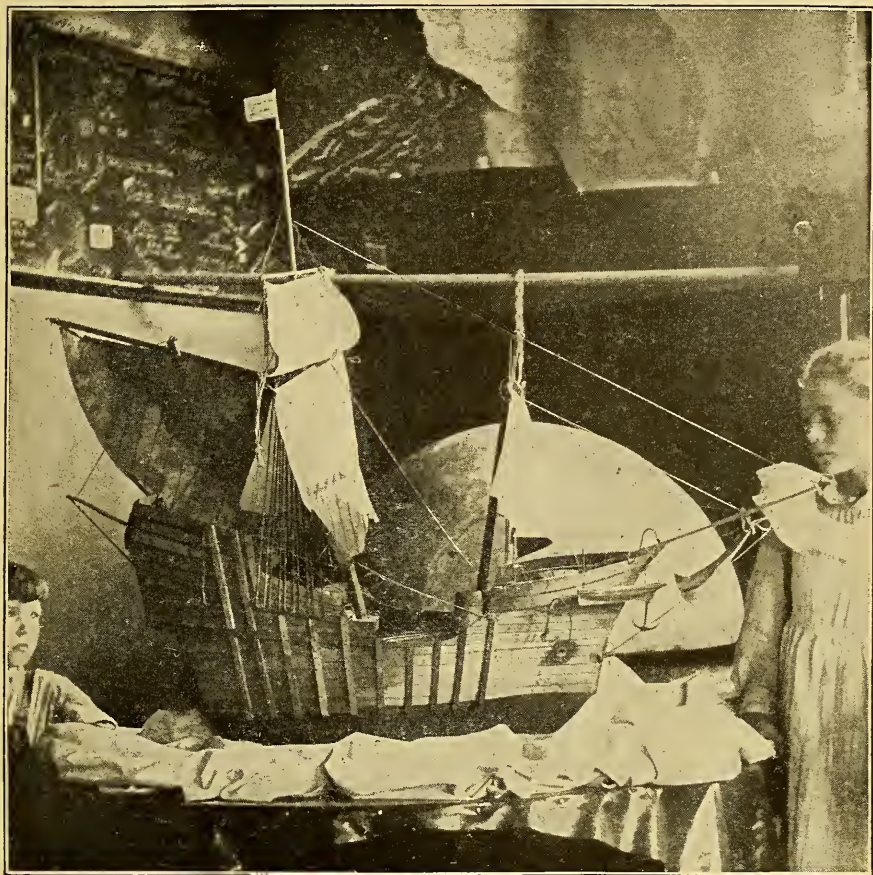
IN RAYMOND'S "Columbus" there are several songs that add much to the drama and should be sung as part of it: "All Hail the Queen," chanted or sung on the discovery of land, "O God of All Things Living," sung at the close of Act III, "Hail to the Hero, Home from Strife," sung at the royal reception of Columbus at Barcelona on the return from the first voyage, and the opening and concluding hymn, "O Life Divine." The charming little motion song "Columbus," with Spanish melody, in Mabel L. Pray's "Motion Songs" (Heath & Co.), is very interesting to the children.

The other songs chosen for the month of October are "Song of the Waves" (Natural Music Reader, 2), Mendelssohn's "Farewell to the Forest," and Franz Abt's "Farewell to the Birds." Here we have chromatic effects like *do-ti-do* in different keys, the double sharp, the chromatic *fi* and *sil*, and slurs. The intervals will also suggest special exercises. The beats divided by dotted notes will need some drill.

Continue the written work and ear-training of September thruout the subsequent months.

DRAWING

If the children have been drawing every day thru September, reciting with the chalk in hand, and illustrating their words



MODEL OF THE SANTA MARIA

with outlines on the board, picturing their visual images in their Historical and Geographical Atlases, they will have started the drawing habit and will strengthen the habit still more in October. Require all drawings to be done with few but firm lines, little or no shading, and no erasing.

Have a great deal of drawing of the human face, in different views, front and profile, three-quarter and all possible intermediate positions; draw hands in various postures; draw cats,

dogs, rabbits, mice, birds, fish, etc., in different natural poses; draw trees, plants, flowers; encourage out-of-school studies in drawing by asking for sketches of domestic animals — horses, chickens, pigeons, pigs, cows, sheep, goats, etc.

Never discourage a pupil by finding fault or chiding him, or, worse still, laughing at his crude efforts. Praise what is good, sympathize with the idea intended to be expressed, and help out his technique, show him how to get effects in the simplest way, and teach him to see for himself.

MAKING

Make paper windmills to show the currents of air (p. 59), wind-vanes to show the direction of the wind, Chinese junks, Columbus's caravels, and costumes and scenery for the Marco Polo dialog and the play of "Columbus." Make a relief globe of clay as described in the *Journal of Geography*, for January, 1904, p. 42.

Make a lung-tester out of two 1½-gallon bottles, and some rubber tubing. (See "A Home-Made Lung-Tester," by Bernarr McFadden, in *Physical Culture* for June, 1904.)

Some of these articles will probably have to be made in November, on account of lack of time in October.



NATURE STUDY

THE tree study of October should be continued into November, but now the trees stripped of their leaves and preparing for winter will form the subject of our study. Make a special study of tree-branching as determining the physiognomy of the tree. Note where the buds are strongest and most likely to prolong the branch or give rise to side branches. Count the age of the branches by the annual leaf-scars. Draw the tree from different sides. Note especially marks of individuality, as peculiar branching.

Remember that clear sense-impression must be individual sense-impression. General notions are easily formed when clear sense-impressions have been obtained. Do not attempt to mix the two and blur the clearness of the individual image.

Note the causes of the variation in branching, if the tree is not symmetrical. Is the north side different from the south side? the east side different from the west side? What things near by have modified sunshine, wind or rain for the tree? Have some of the buds been killed by insects? Is it possible to

train a tree to branch in any prescribed way by simply controlling the growth of the buds and not pruning the branches at all?

Is there any correspondence between the shape of the whole tree and the shape of its parts, as, for example, the shape of the individual branches, the shape of the leaves, the venation of the leaves, the shape of the fruit? What determines where the largest leaves will grow? Do the stoutest branches grow from their axils?

What preparation has the tree made for winter? Study the same tree or several trees as in October. Note all the distinctly favorable influences of a local and individual nature that protect the tree. If, however, it fails to get proper sunshine or food, or is exposed to the cold blasts of winter, or to drouth, note the effect upon it. If you can find animal life on or about the tree, note its effect. Note and watch for later changes. Collect all the insect cocoons, chrysalids, galls, grubs, eggs, etc., you can find on or about the tree. Note how they too have prepared for winter. Study the life history of the insects and birds that find a harbor in the tree.

Recall something of the tree life of primitive man. Miss Katharine E. Dopp's primary book on the Tree-Dwellers is attractive, even for grown persons, and contains the right sort of material.

Recall the ways in which trees are important, aside from their worth as lumber; e. g., forests as shade, as home of man, bird, and insect, their influence on soil and climate; related sentiments inspired by trees, groves, woods — awe, reverence, destiny, growth, decay, age, death, worship, etc.

Tell of historic trees — of the Charter Oak, the Penn Treaty Elm, the Washington Elm at Cambridge, and others.

WEATHER RECORD

If the pupils have been keeping a daily weather record on the blanks shown on page 29, they will now be ready to study the temperature changes over the whole of the United States. Study the daily isotherms on the government map, and note the causes of the irregular bends. Send to the Weather Bureau, Washington, D. C., for the *Monthly Weather Review* (twenty cents a copy). It contains maps summarizing all the weather features of the month, as well as tables giving the data in detail for all the weather bureau stations.

Get a sheet of blackboard slating cloth, 40x50 inches, and mark out the coast lines of the United States with chalk, and then the state boundary lines. With light blue white-lead paint, line in the coast and Great Lakes and such of the rivers as form state boundaries. With white-lead line in the other state boundaries.

This map may then be mounted on a roller, and you will have an invaluable aid in all the weather record work as well as in geography and history. All temporary features may be put in with chalk and erased again at will, leaving the outline map as clear as before.

On this map copy the isotherms daily, and the isobars with the Highs and Lows. Note the wind direction with reference to the Lows, and its influence on the temperature.

Send for a cloud chart in colors prepared by the United States Department of the Navy, Bureau of Navigation, Washington, D. C. This chart contains twelve pictures of clouds, illustrating the classification by the international committee, and costs twenty cents.

GEOGRAPHY

FOLLOW the discoveries and explorations of the coast and rivers of America. Recall the study of the ocean in the fourth grade. The Atlantic Ocean must be studied in order that the routes, the distances, the winds, and the storms of the voyages may be appreciated. The four voyages of Columbus will take us to the American Mediterranean, washing the shores of the West Indian Islands, Mexico, and Central America.

To what part of the Old World Mediterranean Sea does the Gulf of Mexico correspond? the Caribbean Sea?

What corresponds to Florida?

What to Yucatan?

Where is the entrance to the American Mediterranean? In what general direction does it extend?

In what direction does the Old World Mediterranean extend?

Compare the two in latitude. Which reaches farther inland?

Name the largest navigable rivers flowing into each.

How did each aid the discovery and exploration of adjoining continents?

Compare, also, the East and the West Indies, and see how it was possible for navigators for more than thirty years to think that they were one and the same group of islands.

The voyage of Americus and the great circumnavigation voyage of Magellan take us to South America, the Pacific Ocean, and the Philippines. Study the shape and the dimensions of the oceans traversed just as you would the coast line and area of continents. Have an abundance of ocean pictures, and recall stories of the sea studied in the fourth grade.

With the first circumnavigation of the globe the idea of the roundness of the earth began to come into the consciousness of the common people more and more. Perhaps no other proof of

sphericity is quite so convincing. Use globes and rubber balls constantly in place of flat maps. The children will thus be ready for the Copernican System at a corresponding culture-epoch.

Draw the solar system to a scale on as large a sheet of paper as you can manage, but be sure to keep the same scale in representing the sun and planets as in representing their orbits. On the open field or playground mark out in lime the orbits, using as large a scale as possible. To the same scale construct the planets of clay and let pupils run around the orbits carrying the clay planets. The smaller pupils can carry the satellites. If the time of revolution be well managed, the best school orrery will thus be in motion, worth more to the pupils than the most costly piece of mechanical apparatus. The complicated epicyclic orbits of the satellites are thus particularly well represented. Eclipses of sun or of moon can be clearly acted out by this living orrery.

HISTORY AND LITERATURE

IN STUDYING Columbus, Americus Vesputius and Magellan, distinguish sharply between what they were aiming to do and what their work led others to do, between what they thought they were doing and what they really were accomplishing as shown by later history.

The search for the Indies was the aim of all the great explorations of the fifteenth and sixteenth centuries. The discovery of America was but an incident in that great drama of geographical history that, beginning with Prince Henry and Columbus, has ended with the foundation of British Empire in India and American dominion in the Philippines. Columbus thought he had reached Asia, and on his later voyages sought to traverse

the route that Marco Polo had followed on his return from Cam-baluc. Columbus failed to find any thorofare.

After Cabral had happened upon Cape St. Roque, nearly ten degrees east of the Line of Demarcation, Americus was sent to explore the new land, and his voyage was epoch-making in that it completely exploded the Ptolemaic geography and established the existence of the fourth continent, America. "As a feat of navigation," says Fiske, "no voyage previous to Magellan's surpassed this third voyage of Americus, and none, except the first of Columbus, outranked it in historical importance."

Americus explored the farthest limits of the Sea of Darkness and the antipodal world of the southern hemisphere. Not only was the equator crossed, but at South Georgia Americus had reached a point more than twenty degrees farther south than the Cape of Good Hope and more than a quarter of the way around the earth from Lisbon. The aspect of the starry heavens, so important to the navigator in tracing his course, was utterly changed. The Pole-Star and the Dipper sank entirely out of sight, while new and strange constellations appeared in the heavens. The Milky Way changed its shape.

Columbus might identify Florida and Honduras with the coast of Asia and think that he was sailing among the islands of India, but Americus explored a coast that could not be part of Asia nor in fact of any known continent. It was not known to the ancients, it was a "New World." The Florida coast and the islands south of it that Columbus had explored were not a part of the "New World," they were a part of Marco Polo's Asia. What wonder was it that the "New World" was called America, in honor of its discoverer? Note that all of these names were differently used at that time from what they now are. Magellan accomplished what Columbus sought to do but failed in. Magellan's voyage was "doubtless the greatest feat of navigation that has ever been performed, and nothing can

be imagined that would surpass it except a journey to some other planet." Follow Fiske's account in "The Discovery of America," Volume II. For fuller details take Butterworth's "The Story of Magellan," or Towle's "Exploits and Voyages of Magellan." There is more to stir our blood and rouse our enthusiasm in this "prince of navigators" than in any other of the great explorers. "Nor," says Fiske, "can we ever fail to admire the simplicity and purity of that devoted life in which there is nothing that seeks to be hidden or explained away."

"To bring out the correct outline and huge continental mass of North America, and to indicate with entire precision its relations to Asia, was the work of two centuries." We shall recur to this in the explorations of Verrazano, Fray Marcos, De Soto, Hudson, Captain John Smith, La Salle, Marquette, Captain Gray, and Vitus Bering. At every step of advance in the conception of the shape of the continent, we have the two theories, the "wet" and the "dry," the oceanic and the continental, the Mela theory and the Ptolemaic theory, confronting each other and modifying the outcome.

Use Irving's "Life of Columbus" for supplementary reading and Gordon Stables's "Westward with Columbus" for its vivid dialogs and full details that will give life and color to the story. In case Raymond's "Drama of Columbus" is for any reason not used, it will readily be possible to arrange scenes for acting from the chapters of "Westward with Columbus," or from Cooper's "Mercedes of Seville."

Children of the fifth grade still delight in fairy stories. The material most appropriate would seem to be those legends that present the myth of light and darkness in its most attractive form. Let the familiar stories of Little Red Riding-Hood, Cinderella, and Sleeping Beauty be recalled and appreciated in their new meaning.

Little Red Riding-Hood is the Evening Sun, the delight

and comfort of Grandmother Earth. But the Blackness of Night, in the shape of a crafty, deceiving old Wolf, envelops the grandmother and snores as the thunder and storm wind. The huntsman is the Morning Sun, reviving Grandmother Earth and bringing Little Red Riding-Hood, also, back to life. The story represents, too, the changing seasons of the year. The Wolf is Winter, the Huntsman is Spring, and Little Red Riding-Hood is the Sun.

Sleeping Beauty is the sleeping Earth in the winter, which is awakened in the spring by the kiss of the Sun. Cinderella is the Dawn Maiden. The envious sisters are the Clouds, and the step-mother is Black Night, trying to keep the Dawn and the Morning Sun apart. Jack the Giant-Killer is the Sun, which disperses and overthrows the Cloud-Giants on the Sea of Darkness. The House that Jack Built is the World in the various stages of its development. The good ship Argo is the Earth that searches for and bears away in triumph the Golden Fleece from the Sun. If more material is wanted, take Siegfried and the Nibelungen stories.

NUMBER

LAST month's work in ventilation will lead to problems that will extend into this month. Measure the length and width of the schoolroom.

How many square feet of area are there in one strip a foot wide and extending the length of the room? If the pupils are not already very familiar with the calculation of area, the square feet should be marked off on the floor with chalk.

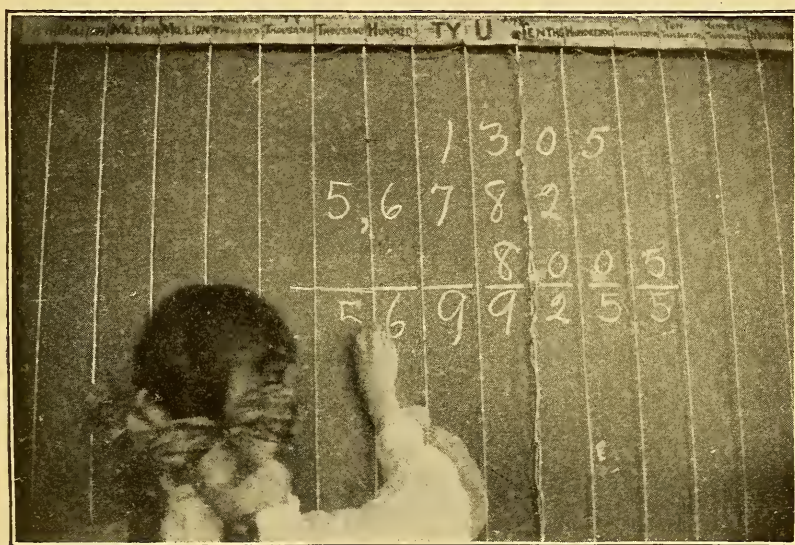
How many strips a foot wide and running lengthwise would cover the floor?

How many square feet are there in the floor area?

How many square feet of floor space would this average for each pupil?

Make a wire outline model of a cubic foot and place it on one of the square feet marked on the floor.

How many such cubic feet would there be in the entire row the length of the room?



NUMERATION FRAME

How many rows would there be in the floor layer a foot thick? How many such layers a foot thick would it take to fill the room?

What is the cubic content of the room?

How many cubic feet of air are there on an average to each pupil?

If each pupil needs thirty cubic feet of fresh air per minute, in how many minutes will the entire air of the room have to be changed?

On the large relief globe measure the length and width of the oceans and calculate their areas. In this way make estimates of the areas of the North Atlantic, South Atlantic, Pacific, Indian, Arctic, and Antarctic Oceans. Compare results with the figures given in the geography.

By measurement on the globe estimate the length of Columbus's first voyage, Magellan's voyage, and the third voyage of Americus. Compare the lengths of the voyages.

Toscanelli estimated the length of the earth's equator to be 25,023 miles; Ptolemy had calculated it to be 23,515 miles; the real length is 24,899 miles. How much too great was Toscanelli's estimate? How much too little was Ptolemy's? Columbus used Ptolemy's figures.

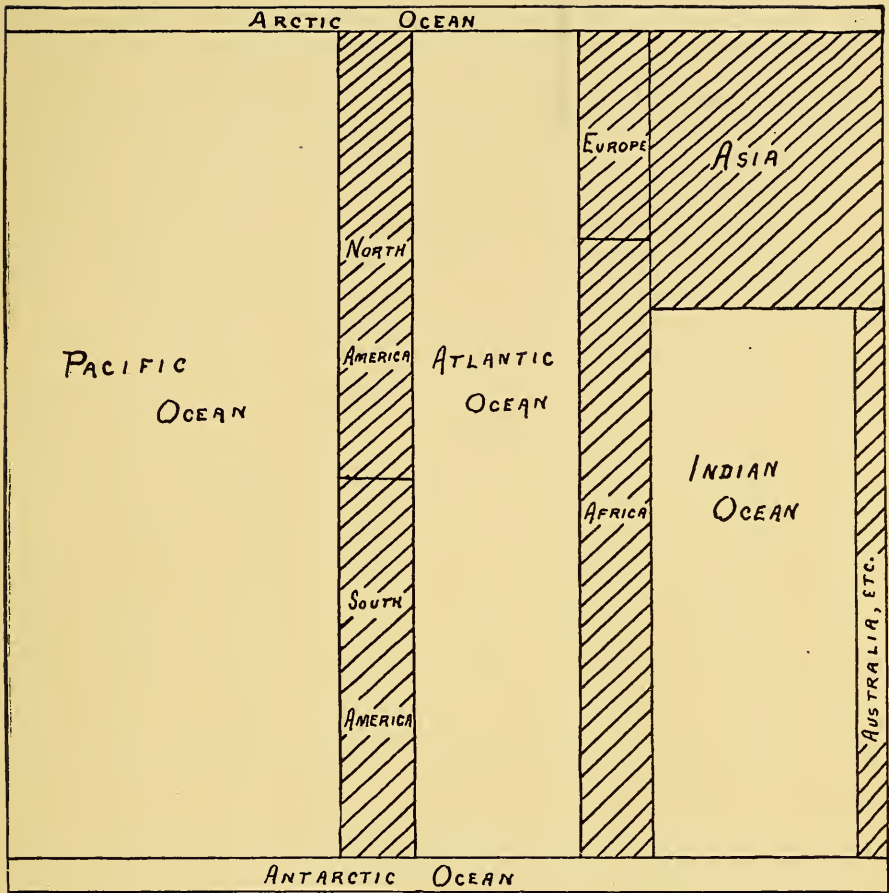
What is the distance from Lisbon to Peking? Columbus estimated that Peking was only about 4,000 miles west of Lisbon and that he would have only about 2,900 miles to sail between the Canaries and Japan. He really did sail a distance of 3,723 miles according to his own dead reckoning. How much longer was his voyage than he had expected?

Calculate the area of the earth's surface. What part of the surface is land; what part is water?

What part of the total sea area is the area of the Pacific Ocean? the area of the Atlantic Ocean? the area of the Indian Ocean? the area of the Antarctic Ocean? the area of the Arctic Ocean?

Treat similarly the areas of the continents as compared with the total land area. These questions had better be answered by using the even millions of square miles.

Draw a diagram to represent these areas as follows: Using the scale of 10,000,000 miles to an inch, lay off on a horizontal line distances to represent the same number of miles as there are square miles in the areas to be represented. Then erect perpendiculars of any convenient length and complete the



SCHEMATIZED MAP OF THE WORLD TO SHOW RELATIVE AREAS

rectangles. The areas of these rectangles will be proportional to the areas of the continents and oceans.

The distances in the solar system should be expressed in miles; in time that it takes light to travel; in time that it takes sound to travel; in time that it takes a cannon ball to travel; in time that it takes a railroad train to travel; in time that it takes a man to walk; in time that it takes a man to count the miles; in multiples of the earth's distance from the sun; in

multiples of the diameter and circumference of the earth; in multiples of the moon's distance from the earth.

Draw the planets and the sun to the scale of 25,000 miles to the inch and cut out the circles. Then calculate the distances of the planets, using the same scale. Let the pupils carrying the scale drawings step off the distances from the sun on the playground or open field, or compare familiar distances in the home town from the schoolhouse or town-hall as a center.

To teach decimals get decimal rulers to measure with — either inches divided into tenths or a millimeter ruler. Let us take as our work the enlargement of the map of North America to twice the scale of the book map. Practice until the pupils become very familiar with reading measurements in decimal form and in writing them accurately on paper. Then drill on the doubling of the measurements. Then we are ready to begin to draw. Accustom the pupils to locating every desired point by two measurements, one from the side margin and one from the top or else from the bottom margin. Such work is admirably adapted to training pupils to care and accuracy in number work.

LANGUAGE

For November the Atlases may include the scale drawings of the solar system; the diagrams made from the number work illustrating relative areas of oceans and continents; the scale enlargement of the map of North America; outline drawings of individual trees without leaves; the pupil's letter to Christopher Columbus telling him what he really did accomplish in contrast with what he thought he was accomplishing, and, perhaps, Columbus's reply to this letter; a concise account of the new and strange sights and experiences of Americus Vesputius on his third voyage; a concise life of Magellan, and papers on

such topics as this: Why was America named after Americus Vesputius instead of after Columbus?

List all the countries, towns, counties, rivers, universities, etc., that have been named after Columbus.

Name the ten foremost discoverers of America, and tell what each contributed toward the discovery of the continent. List the additions to knowledge of the world made between 1300 A. D. and 1525 A. D.

Draw Columbus, Americus, Magellan, the fleet of Cabral off Cape St. Roque, a birdseye view of Americus's third voyage, showing the ships and the incidents of the voyage.

Illustrate Magellan's life with scenes in Portugal, in the mountains, and at court; his services in the East Indies; his exile; his conference with the young king of Spain, Charles V; his preparations at Seville. Draw the spies and assassins by whom he was persecuted; his ships with the sailors in the rigging as they sail down the Guadalquivir; the hurricane in the Atlantic; a birdseye view of the exploration of the La Plata, and of the ships in winter quarters at Port St. Julian; the battle with the mutineers, April 1, 1520; the giants of Patagonia; a birdseye view of the ships sailing through the Strait of Magellan, and out into the unknown Pacific; the landing at the Ladrones on the 6th of March, and at the Philippines on the 16th; the fight on the island of Matan, and the death of Magellan; the massacre at Sebu; the stop at the Cape Verde Islands; the arrival of the Victoria in the Guadalquivir, September 7, 1522.

Retell and illustrate the sun and moon myths.

Arrange to have a debate on the subject, Resolved, That the New World should have been named after Christopher Columbus. While of course two pupils should specially prepare to open the debate, yet the general debate participated in by all the class will prove the most interesting.

GRAMMAR

Teach the order of words and the punctuation of a sentence as the simplest form of diagramming. Connect the pauses and inflections of reading with the same idea. Use the line diagrams as helps to further clearness, but always try to have the full meaning expressed by the way the sentence is spoken.

The objective complement naturally follows the object complement and the attribute complement in treatment. In taking up a new subject always choose clear and short sentences to illustrate the case. Enough differing examples must be presented to represent the different uses of the objective complement, when it is an adjective as well as when it is a noun. The various verbs that are followed by the objective complement should be typically illustrated. The month's work includes the easy construction of nouns in apposition.

SPELLING

Treat all misspelled words individually. Do not depend on merely mechanical repetition, but note the special point of uncertainty and remove it. For example, the doubling of the "m" in the word "diagramming" may be associated with the doubling of the "m" in the word "grammar." The uncertainty in spelling the word "prairie" may be removed by noting that the "r" is like the nose, because it is between two i's (eyes). "Describe" is to be pronounced with the first syllable as "dē" (down), and then we shall not be in doubt whether it is "discribe" or "describe." "Business" is derived from the adjective "busy." Sometimes cognate words will help over an uncertainty, e. g., "conservation" will enable us to remember that the third syllable of "conservative" has an "a" instead of an "i."

In every case remove the cause of the uncertainty forever, and not merely till the next spelling lesson. I had great difficulty in remembering how to spell the word "leisure" till I noted that the other way made it a "lie sure."

Continue phonic drill all the year thru for the sake of teaching spelling as well as for the sake of the pronunciation in the reading and recitation.

THE ARTS

MUSIC

ARRANGE a different opening song for each morning exercise thru the week and then repeat on the corresponding days of succeeding weeks. Thus, for Mondays we sing, "Just for To-Day"; for Tuesdays, "God of Mercy, God of Love"; for Wednesdays, "Try, Try Again"; for Thursdays, "Count Your Blessings"; for Fridays, "God of Our Fathers." Of course it would be well to substitute other songs after a few weeks' use have made these familiar.

The song "Little Jack Frost" should be recalled, or learned if not already known, and its mythical meaning made clear.

The study of Americus's third voyage and the simple facts that led to the naming of the continent after him will give renewed interest in our national hymn, "America."

The songs chosen for November are "The Spacious Firmament on High," "Hail to the Queen of the Silent Night," "The Harp That Once thru Tara's Halls," and "From Greenland's Icy Mountains."

Practice on the intervals found in the songs and especially the slurs. Rewrite $\frac{2}{2}$ time as $\frac{2}{4}$ time and $\frac{3}{8}$ time as $\frac{3}{4}$ time. Continue the work on chromatics, always letting the ear-training and the singing precede the symbols of reading.

Continue the ear-training in major and minor exercises, the recognition of familiar melodies from hearing the first phrase, adding missing notes from ear, writing chromatic exercises as the teacher sings. Pronounce and spell the tonic chord.

Encourage solo work and thruout the year have individual singing daily as a matter of course. Have exercises in breathing and in distinctness of vowel and consonant enunciation.

DRAWING

Draw clouds in outline. Draw a rapidly changing cloud in the successive stages of its mutations.

Draw animals and children in motion, with the fewest but most characteristic lines possible. Sketch changing facial expression. Note what lines are characteristic and leave out all others.

For the birdseye views suggested in the life of Magellan, set up models of the scenes on the sand table first and draw from the model for the larger features but not for the details.

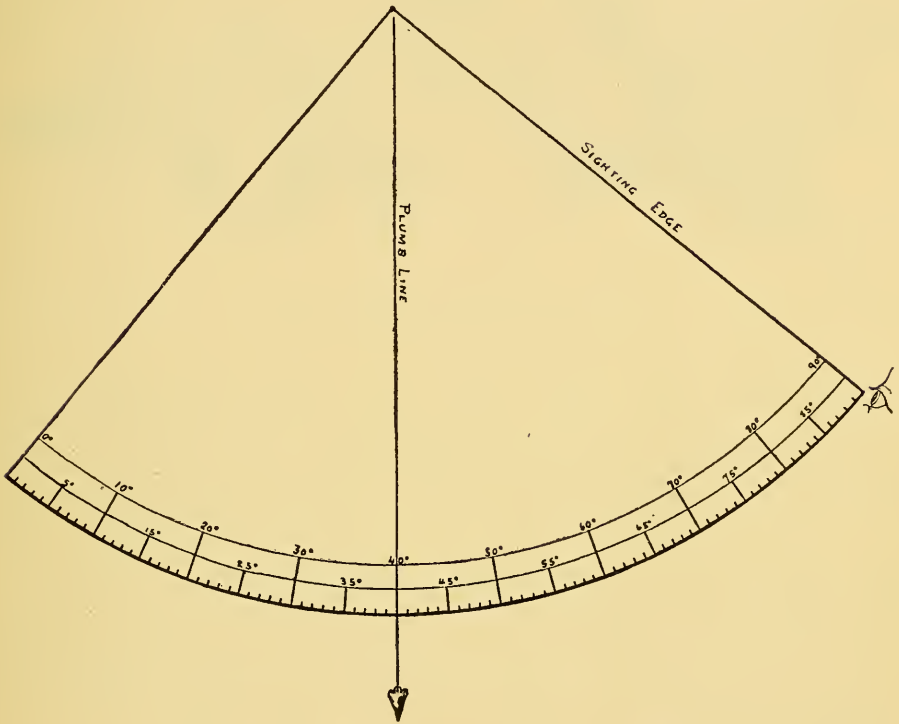
Practice on trees till your drawing shows the kind of tree by the most characteristic features of its branching.

MAKING

Make a simple form of astrolabe. Cut out a quadrant of stiff cardboard or of thin wood and divide its arc into degrees very accurately. Attach a strong thread with a plumb-bob on its end to the circle center. Sight along the straight edge to the object whose altitude in degrees you are taking; the plumb-line will mark the altitude in degrees.

Model Saturn with its rings.

Make models of Philippine houses of bamboo thatched with palm, bamboo bridges, boats, hats, etc.



A SIMPLE PRIMITIVE FORM OF ASTROLABE



NATURE STUDY

WHENEVER snow comes there will be some opportunity for studying footprints. The interpretation of these "stories in the snow," as William Hamilton Gibson calls them, is fascinating, and very stimulating to the observation. In his charming book of nature study, "Sharp Eyes" (published by Harper), read the chapters on "Stories in the Snow," "How Bunny Writes His Autograph," "The Grouse on Snow-Shoes," "The 'Fairy Ring' and the Fairy," "Snow-Quakes and the Snow-Quaker," "Curious Specks on the Snow," and "Snow-Fleas."

Notice the footprints of birds, cats, dogs, rabbits, rats, mice, horses, cows, sheep, chickens, children, and grown folks. It may take a Sherlock Holmes to unravel the mystery of all the activities, characteristics, and purposes indicated by the footprints, but it is one of the best sorts of nature study for the winter. Trace also the wind forms in the drifts. Note the sweep of the wind currents about obstructions, as shown in the snow-drift modeling. Model a sand-drift similarly by wind from a hand-bellows on the sand table.

This detective search for clews in the footprints in the snow

may be followed by the study of the fossil forms in the rocks, for the understanding of which it will prepare. Of course study the fossils of your own neighborhood. In the Monongahela Valley we have all the strata above the Pittsburg coal vein exposed in the steep cliff along the river bends, and in the shale above the coal are to be found abundant plant fossils and some animal forms. Teachers in this part of the country should have these carefully drawn and compare them with the ferns, horse-tails, club-mosses, etc., of the present.

Tell the story of coal formation. Model the cliff and imitate the coal formation by stages of lake, swamp full of charcoal (powdered), muddy ocean depositing layers on its bottom, and risen land mass. Then make a miniature river wash down its bed thru these strata, thus exposing the coal formation as the real Monongahela River has done. This can very readily be done by having the "formation" in a long, shallow, sheet-iron pan and letting a rubber tube supply the water to a miniature lake in the upper "valley."

Sketch the chief geologic periods in a chart of the cross-section thru the crust of the earth. In a series of maps show the growth of the continent thru the Archæan, Paleozoic, Mesozoic, and Neozoic Eras. Such charts are contained in Appletons' Physical Geography, Le Conte's Elements of Geology, Tarr's Elementary Geology, etc.

Map and teach the zodiacal constellations, the Great Bear, Orion, Lyre, Cassiopeia, and the Dolphin. Give the main points in the history of astronomy—from the lives of Copernicus, Kepler, Galileo, Herschel. Get a telescope and show the great nebula in Orion. Sketch the nebular hypothesis in simplest concrete form. Give the children a chance to see Saturn, and let his rings show how worlds and moons were made. Examine the moon thru the telescope; it is the most fascinating object in the sky.

WEATHER RECORD

The children have every day been noting the appearance of the moon and recording its phases in their weather records. It is now time that this basis of observation be extended to the fuller understanding of the motions of the moon and the causes of its phases.

Trace the moon thru the constellations of the zodiac during the month. Note its changing phases as it moves onward. How long is it from new moon to new moon? From new moon to first quarter? to full moon? to third quarter?

Illustrate the movement of the moon by having a pupil carry a rubber ball (whitened on one side and darkened on the other half) around the other pupils grouped in the center of the room. The pupils will then see the moon as we see it from the earth. Keep the white side of the rubber ball toward the window as toward the sun, and go in the direction opposite to that in which the hands of a watch move.

Note the waxing crescent. In what direction do the horns point? In what part of the sky do we see the waxing crescent at sun-down?

When is the moon gibbous?

At sunset where do we find the full moon? At midnight where is the full moon? at sunrise? at noon?

Why do we not see the waning crescent after sunset? When is the best time to see it?

What is the interval between one full moon and the next?

How many lunar months are there in the year?

GEOGRAPHY

FOLLOW the Spanish explorers thru Mexico, Peru, Panama, Florida and the Gulf Coastal Plain. Study the physiographic

features — climate, forests, and natural products — of these regions as they were in the sixteenth century. In connection with the history of Cortes, Pizarro, Balboa, De Soto and Coronado, study the names of all the natural features, such as rivers, mountains, plains, bays, etc., that are derived from Indian or Spanish names.

Secondly, in contrast with these regions as they were three hundred and fifty years ago, study them as they are at present; e. g., De Soto sought an El Dorado in what he still thought was Cathay. The cotton crop of the Southern States was worth \$600,000,000 in 1903-4, or double the gold production of the world for the same year. What new features have been added? Study the population, white and colored; agriculture, products new and indigenous; forests; grazing; minerals; manufactures; cities; and transportation routes and commerce.

Thirdly, consider the possibilities of the future for the American Mediterranean, when the Panama Canal shall have been completed. The Gulf coast of the United States measures 1,852 miles, while our Pacific coast stretches only 1,810 miles. The great Mississippi Basin naturally empties its immense harvests and manufactures into the ships that sail the Gulf. With the opening of the Canal, the trade with the entire Pacific Coast and the Indies can be reached.

Point out the similarity between the two Mediterraneans. They both open toward the Atlantic Ocean, one eastward, the other westward. The Old World Mediterranean needed to be connected with the great ocean at its southeastern end, to be a thoroughfare; the New World Mediterranean must now be opened to the great ocean toward the southwest in order that it may become a highway of commerce for the world. England has succeeded to the shortened Portuguese route to the Indies, while the United States is just now preparing to shorten the Spanish or Columbian route to the East by sailing west.

Note the growth of New Orleans, Galveston, and other southern ports in recent years. Study the north and south lines of railroad that reach New Orleans, Mobile and Galveston. Read from the daily papers some of the stories of shipwrecks in hurricanes off the Gulf Coast.

As the geography narrows down to the more detailed study of limited regions it will be necessary to use flat maps. The weather record work in connection with the government weather map of the United States has already made the pupils somewhat familiar with the state boundaries, present cities, and meteorological conditions of our country. But I have found nothing equal in value to a large floor map in developing a vital concept of the country as a real part of the earth's surface.

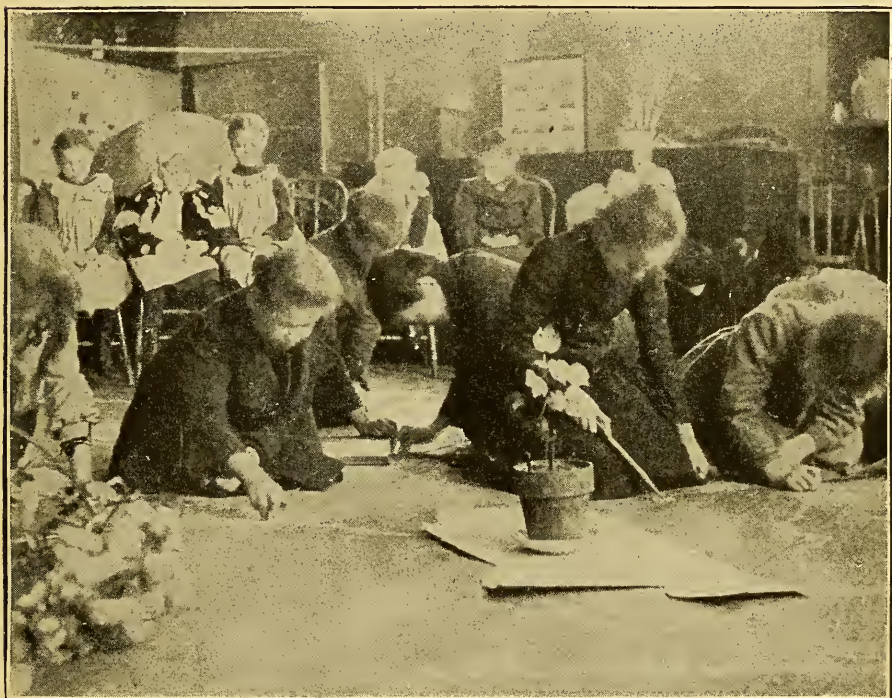
Standing on the floor map a pupil has the directions just as he has them on the earth; the scale of New England is the same as that of Texas or California, and he gets the relative size fixed correctly in his visual image. As he moves over the map from state to state, or from hill-top to plateau or plain or prairie; or ascends or descends the streams; or crosses by the Indian trails or the great railway routes, he is combining motor images with his sensory images as he would combine them in traveling thru the country.

Then, too, the scale may be made larger on the floor than on any wall map, and hence the features may be shown more plainly. Think of the pedagogic value of size in the great open-air model of Palestine in the Park at Chautauqua, of Jerusalem at Ocean Grove, and the growing-crops map of the United States at the Louisiana Purchase Exposition. The scale of most of our little book maps is quite impracticable either for the purpose of forming a shape or area concept, or for scale calculation.

The scale I have found most convenient to use is ten miles to the inch, as calculations of distance may then be made directly from inch-measurements on the map without any figuring what-

ever. Be sure to have the map directions correspond with the actual earth directions.

To make the rivers and coast line permanent they may be gouged out of the floor by a small, sharp gouge. This will help very much in giving to the map somewhat the appearance of a



MAKING THE FLOOR MAP

relief map, and will make the rivers look natural. The bed of the rivers may be nearly filled with paint, which, being slightly below the level, does not wear off in the constant use of the floor.

All water features should be put on in blue paint, the varying tints of blue to indicate the drainage systems. The contour lines for height may be put on in yellow, red, brown, or other color

as one chooses, white being reserved for artificial boundaries and black for cities, railroads, etc.

The population of the cities is indicated by tacks and brass and iron brads. Thus, a brass-headed tack alone indicates a population of less than 100,000; with a brass brad beside it it marks a population of 100,000; by two brass brads a population of 200,000 is shown, etc.; with three brass brads and one iron brad a population of about 350,000. The cities of over a million in population — New York, Chicago, and Philadelphia — are best represented by tacking on pieces of tin, cut in shape of city boundaries to scale.

All temporary features, such as routes of discovery, temporary boundaries, dates, names of places or of explorers, products, etc., may be put on by the pupils in chalk. When the floor is mopped the map will be fresh again for any new chalk features.

It will also be found very helpful to have large charts of the states cut out on their boundary lines and with the physical features marked on them. Use the scale of ten miles to the inch. These may be used on the floor map in comparing areas and in emphasizing outlines.

HISTORY AND LITERATURE

DURING December we have to follow the Spanish, French, Dutch, and English explorers in their further discovery of America. "The wreck of the Admiral's flagship on the Christmas of 1492 determined the site of the first European colony in the New World. . . . There the Spanish colonial society assumed its earliest type. From that island we have seen the lines of discovery and conquest radiating westward with Velasquez and Cortes, and southward with Balboa and the Pizarros. To Hispaniola we returned in order to trace the beginnings of

Indian slavery and the marvellous career of Las Casas. From Hispaniola we must now again take our start, but to return no more. We have to follow the lines of discovery northward with Ponce de Leon and Pineda, and far beyond them, until we have obtained a sketch of the development of the knowledge of the huge continental mass of North America. This development was the Work of Two Centuries, and during that period much other work of cardinal importance was going on in the world, which had resulted before its close in the transfer of maritime supremacy and the lead in colonial enterprise from Spain and Portugal to France and England.” *

Make a more detailed study of the expeditions to the west under Cortes for the conquest of Mexico, to the south under Pizarro against Peru, and to the north under De Soto for the exploration of Florida. Follow Fiske’s account of the wonderful march of Cortes after sinking his ships. Use pictures profusely to draw out the imagination to realize that force of four hundred and fifty mail-clad Spaniards marching with their half-dozen small cannon and fifteen horses to the conquest of a nation.

The Aztecs regarded the Spaniards as gods, and the horses as frightful supernatural monsters before which they fled in an ecstasy of terror. “As the little army advanced, its progress was heralded by awe-struck couriers who made pictures of the bearded strangers and their hoofed monsters, and sent them, with queer hieroglyphic notes and comments, to the Great Pueblo on the lake.”

Bring out the most essential points of difference in the ideas, culture, religion, laws, and power over nature among the Spaniards and among the Aztecs. Picture the thrilling moment when Cortes and his men first came into view of that city of wonders on the Lake of Tezcuco. Give a good deal of time and pains to

* Fiske, “Discovery of America,” Vol. II, Chap. XII.

imaging in language and pictures the civilization of the Aztecs. From the map and description in Fiske's "Discovery of America" model the valley of Mexico on the sand table.

Treat the conquest of Peru more concisely, but make plain to the children that the Spaniards were taking possession of the



FLOOR MAP SHOWING WHEAT AREA

country "by the same sort of right as that by which the lion springs upon his prey."

Make clear the fact that the Spanish colonies were, for the most part, in territory occupied by the half-civilized Indians; and that the Spaniards simply took possession of the countries

and turned over a large part of the revenues to the government at Madrid.

Study De Soto's expedition thru Spanish Florida as a type of pioneer exploration, giving considerable time to the physiographic features of the country and to the type of culture represented by the Creeks and Seminoles.

The story of the French pioneers is briefly told. Touch on the Newfoundland fisheries (Cape Breton, 1504); Verrazano's coasting trip ("Sea of Verrazano"); Cartier's exploration of the lower St. Lawrence, and later the vital work of Champlain, the founder of Canada; and lastly, the bloody story of the Huguenot colony at Matanzas ("slaughter") in Florida.

The vital chain of French exploration is all in connection with the great rivers of North America — the St. Lawrence with the great Lakes, and the Mississippi with its tributaries. The purpose of the French was to reach the interior of the continent for the fur trade and for missionary work among the Indians. Hence their chief contribution to the discovery of North America lay in their demonstration of the hugeness of the interior extent of the continent, the dissipation of the "Sea of Verrazano," and the opening up of the natural highways of the interior along the rivers and over the portages and Indian trails.

The struggle between Spain and England in the sixteenth century should be arranged artistically as a great drama of the nations, starting with the pictures of the dazzling splendor of the continental empire of Spain in America, and her vast European dominions that made the Atlantic Ocean the "Spanish Main," covered with Spanish treasure ships which the English buccaneers lay in wait to capture.

The second act opens with the Inquisition in Spain and the Revolt of the Netherlands. Act Three shows "an entire nation condemned to death" by Alva, and France drenched in the blood of St. Bartholomew's Day; with "Matanzas" in Florida

as the colonial counterpart. In the fourth act England begins to help the Dutch, and Spain gathers her strength to annihilate her antagonist. In Act Five the story of the overthrow of the Invincible Armada is told. The way is open for the English settlement of North America.

The later drama of the French and English struggle, 1689 to 1763, is reserved for the sixth grade.

Use Fiske's "Discovery of America" for facts and as literature. Seek to acquire something of his charmingly clear and fluent style. Selections from Prescott's "Conquest of Mexico" may be read to the class.

Some of the "Stories in the Constellations" should be told to the children in connection with their study of the stars.

Some folk-lore stories may appropriately meet the eager demand of the children for this sort of literature. The "Story of Reynard the Fox," by J. J. Mora (Dana, Estes & Co.), or some of Joel Chandler Harris's Uncle Remus stories will be found suitable for the grade.

NUMBER

THE study of the moon will make desirable the comparison of the astronomical time units—the terrestrial day, the lunar month, and the solar year. As the resulting ratios are all incommensurable, only their approximate values can be found.

Find (to hundredths) the number of lunar months in a solar year. A solar year is 365 da. 5 hr. 48 min. 46 sec.; a lunar month is 29 da. 12 hr. 44 min. 3 sec.

Find the difference between a lunar month and each one of the calendar months.

What is the difference between the Julian year (365 $\frac{1}{4}$ days) and a solar year? In how many years would this difference

amount to a whole day? How many days would it make in four centuries?

The Julian Calendar was used till the year 1582 (in England till 1752). How many days too long are 1,600 Julian years? (Explain Old and New Style.)

On the floor map measure the length of De Soto's route thru the Gulf Coastal Plain, and calculate the distance in miles.

Do the same approximately for Coronado's exploration.

Calculate the distance from your home town due north to the Canadian border; due south to the boundary line of the United States; due east to the Atlantic coast; and due west to the Pacific coast, and fix these distances in memory for orientation.

With the metric ruler enlarge the map of the Southern States to double the scale. Locate every point by two measurements, one from the top of the map and one from the right (or else the left) margin. The pupil will note the distances in his tablet as follows:

POINTS	DISTANCE FROM TOP	DISTANCE FROM RIGHT
Cape Hatteras.....	27 mm. $\times 2 = 54$ mm.	3 mm. $\times 2 = 6$ mm.
Cape Fear.....	42 mm. $\times 2 = 84$ mm.	19 mm. $\times 2 = 38$ mm.
Savannah	63 mm. $\times 2 = 126$ mm.	40 mm. $\times 2 = 80$ mm.

and so forth, using as many points as are necessary to determine the shapes of the state boundaries, and even points in the river courses, location of towns, etc.

It is well to make out the above table complete before beginning to draw the map. In fact, the map may be left to the geography period or be assigned for preparation at home.

Calculate the density of population to the square mile in each of the Southern States.

Find the total population of the section, and the density of population for the whole section.

List all towns with over 10,000 people in order of size.

Using the scale of 1 mm. to 10,000 people, construct a chart by drawing straight lines to represent the population. Represent the white and negro population separately.

For all such statistics it is desirable to have the volumes of the Twelfth Census. The next best thing is the Abstract of the Twelfth Census (395 pages) to be had from the United States Census Office for thirty-five cents. In lieu of either of these one can get many facts from the population figures of the census in the geography text-books. The greatest help in appreciating numbers is graphic representation in the form of charts.

The average yield of cotton per acre is 250 pounds, and 500 pounds make a bale. How many acres would it take to keep an Alabama mill running a year if the mill uses 15 bales of cotton a day? How many such mills could the cotton acreage of Alabama supply with cotton?

How many Fall River mills, each using 115 bales per day, could be kept running on the cotton crop of Mississippi?

How many bales of cotton will a 600-acre plantation produce?

At 5 cents per pound, what is a bale of cotton worth?

At $7\frac{1}{2}$ cents per pound, what is the worth of a bale?

If the price rises to 13 cents per pound, what is the increase in the value of a bale?

What is the cotton on a 600-acre plantation worth, at the market quotation in the daily paper? What is the money value of the Texas crop? of the crop of the whole cotton belt?

The consumption of sugar in the United States is 70 pounds per capita. How many pounds are needed for the whole country?

The United States produces about 372,000 tons annually. What percentage is raised in the country?

In 1850 the price of a pound of granulated sugar was 20 cents, in 1870 it was 14 cents, and in 1904 it is about 5 cents.

What per cent did the price decrease between 1850 and 1870? between 1850 and 1904? between 1870 and 1904?

From the forests of the Southern States ten billion feet board measure are cut every year. How much would this lumber be worth at an average valuation of \$18 per M board feet?

LANGUAGE

TRAIN your pupils to think and speak connectedly on their feet. Assign topics, and expect the pupil called on to give a reasonably complete report on it without having it picked to pieces by the teacher's questions. Train your pupils to make and use outlines.

The correct use of sentences and paragraphs cannot be taught until the children think in sentences and paragraphs, that is, topically and completely.

Vary the dictation exercises by having the children write out songs, poems, prose selections, quotations, proverbs, rules, etc., from memory.

For December the Atlases may contain the map of the Southern States; an historical map with Hispaniola as the center, showing the Spanish explorations, conquests and colonization south, west, and north from this base; a condensed account of the conquest of Mexico by Cortes; an account of De Soto's expedition (as written by a survivor after his return to Spain); the drama of Spain's glory and humiliation in the sixteenth century as worked out by the pupils with the teacher, and the culmination in the overthrow of the Invincible Armada; a list of the additions to knowledge of the world made between 1525 and 1600; the geological chart; the phases of the moon; the stories in the constellations; the graphic charts showing statistics of the Southern States; and an abundance of pictures illustrating people, dress, boats, implements, houses, birdseye views of Mexico, the burial

of De Soto, Drake singeing the beard of the King of Spain, the defeat of the Armada, etc.

Arrange to have three-minute speeches on Cortes, De Soto, Drake, Raleigh, Queen Elizabeth, bringing out points of character or relation of events that are of importance.

GRAMMAR

For December the prepositional phrases receive attention. In use they are distinguished as adjective phrases and as adverb phrases. To bring out their nature vary the sentence to express similar thought in different forms, thus: The Spanish King — the King of Spain — Philip the Second of Spain; purposely — on purpose — in order to — with the intention of — knowingly. Note shades of meaning and choose the expression that is most appropriate.

In one of Fiske's paragraphs list the adjective and adverb phrases, and notice why they are better than simple adjectives and adverbs would be in their places.

Why is the phrase differently placed in the order of words? The adjective usually precedes its noun, the adverb its adjective or its adverb. Why does the adverb follow the verb? What difference is made by putting it before the verb?

Why do phrases usually follow the words they modify? Do they always?

Learn a list of the commonest prepositions.

SPELLING

Make the children refer constantly to the dictionary. It is not so much *what* they find as *that* they find the word in the alphabetic list. The mere hunting for a particular word is one very good exercise to impress the correct spelling on the mind. The searching thru the word list keeps the spelling of the word

in the mind of the searcher. Require promptness in the finding of the word, or the search will degenerate into dawdling, and the pupil will even forget for what word he was looking.

Teach the formation of derived forms, plurals, past tense, perfect participle, and present participle. Accustom your pupils to the way these forms are represented in the dictionary. Have them look up the participles of a list of verbs. Teach the formation of the third singular of the present of the verb. Have the formation illustrated so often that the children will see the rule of spelling involved.

READING

It will seldom be found desirable to allow the better readers among the pupils to read in the reading class. The purpose of that class is to afford the poor readers needed drill. Occasionally it will stimulate interest and effort in these dullards to have some of their brighter comrades read the lesson to them. Usually, however, the time of the good readers is too valuable to be used thus. They need practice, nevertheless, and should have it by individual reading in connection with the various exercises thru the day.

For instance, a good reader may give a prepared reading of a selection at the opening exercises, or at the close of the afternoon session. The secretary of the Literary Society has the minutes every week to prepare and to read. At each meeting of the society there are two or three short prepared readings.

All individual or original work needs to be presented to the class by reading, as, for example, when a pupil has had reference work assigned him and is ready to report on it. The best kind of work is the silent individual reading of some assigned topic or article in book or magazine, then the condensation of it for presentation to the class.

THE ARTS

MUSIC

THE songs for December are "He Shall Feed His Flock," from Handel's "Messiah," "Softly Now the Light of Day," and "Day Is Dying in the West." Select the difficulties from the songs and make up the exercises to give the needed practice on these points. In the exercises use the syllable names of the notes sometimes, but vary by singing *la* or *loo*. Try to develop the natural feeling for rhythm this month, taking the divided beats resulting from the dotted halves, quarters, and eighths.

Have the pupils complete, from memory, familiar melodies, when part of the notation is given them, as, for instance, adding time, key, signature, and missing notes and bars.

Continue the ear-training with exercises, as indicated for previous months.

DRAWING

The rapid drawing of changing figures, passing clouds, and moving animals, and the attempt to catch and fix on paper the flitting elements of facial expression, will require concentration on the lines of force — the reduction of the drawing to its lowest terms, so to speak. Help the pupils to achieve this by blocking in, by using every device that *suggests* rather than *portrays*. Do not force your adult sight on the children; they must draw what *they* see, not what *you* see. Imagination must always make the larger part of a picture. Leave abundant room for it in the unfinished details.

Draw the "footprints in the snow" (or even make them in mud or lampblack on boards to draw from and study); the geologic fossils of the neighborhood; landscapes with the moon in

different phases; birdseye views of Hispaniola and of the city of Montezuma; the Spanish army of invasion landing at Vera Cruz; the death of Montezuma; the "Melancholy Night." Make illustrations showing the dress of the mailed Spaniards; their war horses; the dress of the Aztecs; their houses; their dining customs; market scenes; the temple worship; the human sacrifices. Show Pizarro and his voyage to the Inca's country; the strangling of the ransomed Inca; the burning of the chieftain Chalcuchima; the triumphal entry into Cuzco and inauguration of Manca as Inca; then the building of towns by the Spaniards; newcomers by the ship-load despoiling the temples and carting away the plunder. Sketch De Soto's expedition landing at Tampa; the surprise; the meeting with the Indian queen on the Savannah; the pearl fisheries; the escape of the queen; the battle of Mauvila; the discovery of the Mississippi; the death of De Soto, and his burial; the remnant of the expedition returning down the Mississippi and along the coast to Tampico. Draw Drake's ships, and make sketches showing some of his exploits on the Spanish Main or in the harbor of Cadiz. Illustrate scenes in the voyage and defeat of the Armada. Draw Raleigh and Queen Elizabeth; Shakspeare and the Globe Theatre. Make abundant illustrations for the "Story of Reynard the Fox" or "Brer Rabbit"; show cotton-picking in the South; draw semi-tropical fruits, etc.

It is not to be understood that these subjects are to be assigned in the drawing period and drawn as required tasks. While the story or history is being read or told to the class, the children draw on the board, or on their tablets, or take part in the discussion by asking or answering questions, the teacher doing the same. The pictures are then used in the rehearsal of the stories and in clearing up misconceptions.

MAKING

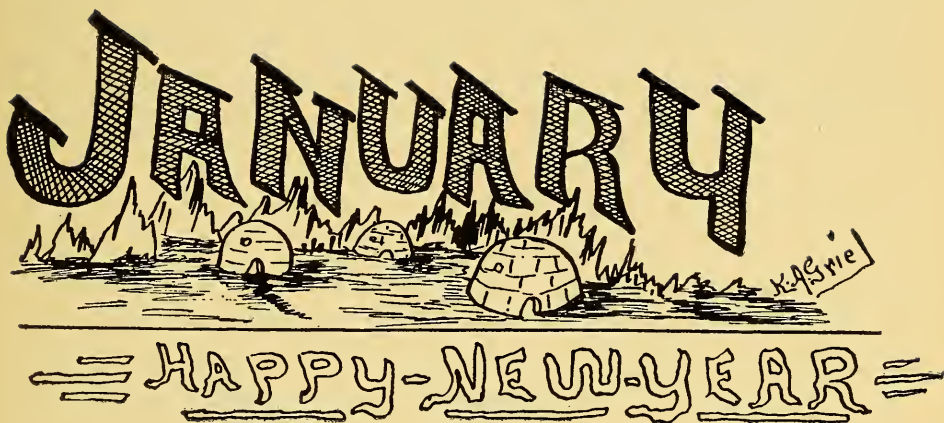
From the seed raise in the schoolroom rice, cotton, tobacco, sugar-cane, and orange and lemon trees. The seeds ought to be planted as early in the school year as practicable, or the plants may be kept from year to year. Use the plants for models in sketching, and painting in water colors.

The pupils may cut out the large state maps (ten miles to an inch) on their boundary lines. It will be sufficient for December if they have the Southern States ready.

Make a model to scale of the geologic formation of your neighborhood. Here in California, Pa., the vertical cliff across the river from the town furnishes us with the material ready to hand in a very easily made model.

Dress dolls to represent Cortes, Montezuma, De Soto, etc. Make in clay models of Mexican houses, temples, etc.

Try making a model of a cotton gin. Somewhat easier is a model of a cotton press for putting cotton into bales.

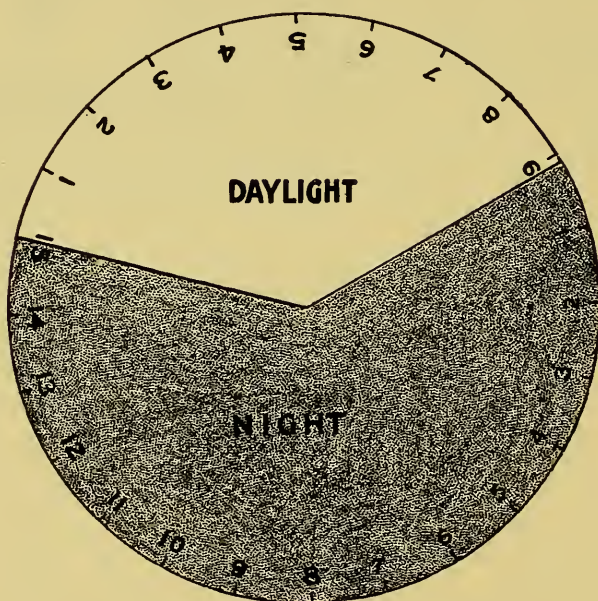


NATURE STUDY

WITH the new year we turn to the study of pets and domestic animals. Here certainly we can study the footprints in the snow or in the soft earth. Pets are, moreover, individual and personal. If we admit that any of the lower animals reason and feel shame, repentance, or knowledge of having done wrong, it is the experience with pets that convinces us. They come the nearest to sharing our joys and sorrows. They are the connecting link with our "elder brothers" that are more remotely akin to us in mental life. Let us have individual studies and reports on the pets that the children have at home. Let us hear of the care, the nursing, the sheltering, the feeding; of the individual peculiarities of disposition, the attempts to do things in some new way; of new tricks, original or taught to the animal; its moods; how the animal shows its feelings, what it does that is like reasoning; how many words it understands and obeys; how

many different vocal expressions for ideas or feelings it has; how it knows its master, and how it expresses this. Tell of any interesting experiences with the pets. Draw the animal in as many characteristic attitudes as possible.

Read Andrew Lang's "Animal Story Book" (Longmans); Hermon Lee Ensign's "Lady Lee and Other Animal Stories" (McClurg); Sarah K. Bolton's "Our Devoted Friend, The Dog"



DAY AND NIGHT IN JANUARY

(Page & Co.); "Rab and His Friends," by Dr. John Brown; "How William of Orange Was Saved by His Dog," told in Motley's "Rise of the Dutch Republic."

The domestication of animals was one of the first steps in the development of the race from savagery. Its fundamental character and value for education are evinced in the passion of chil-

dren for pets; in its widest sense, and possibly including hunting and fishing, it forms the true elementary zoölogy.

The other special topic for the month is food, including the distinction between food and stimulants. The importance of the reserve power that accumulates as a "good constitution" from heredity and an abstemious but nourishing diet, should be illustrated by stories of those who in critically important emergencies were able to bear the strain upon them.

Test for the chief chemical constituents in food, starch, albumin, fat, etc.

Trace the source in nature of the foods that come to the table. Teach their preparation from the raw state for the market. If cooking is taught in your school, as it should be, correlate this work with the domestic science work.

Recall the food of birds, and make the catalog as complete as possible. List the food of your pets and other domestic animals. Extend the list to include insects, wild animals, fishes, etc. How do the plants get their food?

Plagues of locusts, lice, army worms, boll weevils, rabbits, mice, etc., are generally due to a temporary disturbance of the balance in the interrelation of food supplies of the animals concerned. Man's control over the mighty army of harmful and useful "elder brothers" is mainly thru learning their feeding habits and then modifying the conditions by introducing friends or foes, as the case may be, to aid or to destroy the species concerned. Thus, the boll weevil is preyed upon by a little red ant of Mexico, which it is proposed to introduce into the Southern States to check the spread of the cotton destruction.

Useful suggestions for a further study of food are found in Jackman's "Nature Study" (pp. 180-187).

WEATHER RECORD

By the close of December the children will have become familiar with all parts of the weather record. The shortest days come just as vacation begins. By the time school opens after the holidays the afternoons are perceptibly lengthening, while the mornings remain nearly stationary. Thruout the month the lengthening averages a minute and a half a day at forty degrees north latitude.

Cut two circular discs from stiff cardboard and fit them together by slitting each to the center, so that each will turn on the other. (See figure on page 124.) Divide the circumference of each into twenty-four equal parts and number them as hours. If one of the discs is dark it will the better represent the night. These discs may be used to represent the absolute and the relative lengths of day and night thruout the year. Illustrate the longest day in different latitudes, north and south; likewise the shortest day.

As soon as the floor map is ready for use bring the children out on it to represent in active movement the weather changes over the whole country, as these are reported by the Weather Bureau on the daily weather map.

EXERCISE NO. I

The Highs and Lows, Clouds and Winds

Have a girl step out on the map carrying a rod with the word "High" on its top. She takes her position where the weather map reports a High. If there are several Highs, let each be represented in the same way. Have the "Lows" similarly carried by boys. The pupil reading the weather map then calls out the condition of the weather, e. g., "Minneapolis clear, Chicago clear, St. Louis cloudy, Memphis cloudy, Lincoln cloudy," etc.



FLOOR MAP SHOWING HIGHS AND LOWS

(Clear, Girls; Cloudy, Boys)

As the cities are called the pupils step out on the map and stand on the place named, the boys representing the cloudy weather and the girls the clear weather.

When all the members of the class are out on the map, the reader again goes over the list of signal stations, this time calling out the direction of the wind. As each town is named the pupil standing at that point turns and faces the direction in which the wind blows.

The pupils may be questioned as to what changes of temperature they expect at the places at which they are standing, in con-

sequence of the wind direction. Cooler may be indicated by turning up the coat collar or putting a handkerchief around the neck, while warmer is shown by fanning or unbuttoning the coat or wiping the brow with the handkerchief.

This exercise should be repeated each day. It takes but a very few minutes, and occupies all the class in an active, co-operative, thinking drill.

When the children are somewhat used to the procedure, they may be asked to face the direction in which they think the wind should be blowing, without being told the direction till afterward. This will accustom them to the significance of the Highs and Lows. They may anticipate the position of the clear or cloudy weather, also, and thus be trained to forecast the weather from the fundamental conditions.

EXERCISE NO. II

The Movement of the Highs and Lows across the Country

As the children become accustomed to the representation of the weather in this way, the changes from day to day may be acted out by the class without any break in the performance.

The Highs and Lows, moving eastward across the country, carry similar weather conditions of cloud or clear, of wind direction, and of temperature eastward. Hence, in general, the children have only to move eastward about six hundred miles and they have brought with them the weather of the next twenty-four hours. This may be corrected by reading the weather from the map of that day, and noting any irregular movements, as the breaking up of a cyclonic center, its disappearance, or the formation of new centers in the south or southwest, or, as is more usual, in the far northwest.

EXERCISE NO. III

The Rainfall or Snowfall

As the reader of the weather map calls out the names of the signal stations, with the reported rainfall or snowfall, the children step out on the map, the boys to stand for rainfall and the girls to act the part of snowfall. Each one carries his or her decimal inch ruler and indicates on it the amount of rain or snow that has fallen, by sliding a white paper marker along the ruler. The progress of the storm to the eastward may also be acted out by all the pupils moving eastward till they reach the coast, whereupon they take their seats.

EXERCISE NO. IV

The Isotherms and the Isobars

The reader calls out the thermometer reading at the different stations, and the pupils step on the map, remembering the temperature of the place they are standing on. After the map is full of pupils, those at places with a temperature of zero hold up their hands; then those at 10° ; then those at 20° , and so on as the wave sweeps southward.

The isotherms may be represented by a cord held by all of those having the same temperature. The boys may stand for temperatures above freezing and the girls for temperature below freezing.

The isobars may be similarly represented. Rising or falling of either barometer or thermometer may be indicated by the position of the hand up or down. The boys may stand for barometer readings below normal and the girls for barometer readings above normal.

Monthly or seasonal averages may, of course, be represented in the same way as the daily weather conditions. While the children are standing on the map, they may be questioned as to

the causes of local differences; as, for example, near the coast, in the Lake Region, in the Rocky Mountain states, in the Great Basin, along the Pacific slope, etc.

Such thinking of the weather in large areas will be found most valuable in making the mind familiar with the country as a whole. If a snail grows large in proportion to the size of the pond he lives in, how much more important for the heart and mind of a man is the size of his thinking and feeling!

GEOGRAPHY

IN THE course of the seventeenth century the Atlantic seaboard was settled from Newfoundland to the Carolinas. This is the region to be studied thruout January and February. In January we take from the Hudson to the Savannah, and study first of all the physiographic features that the Indians and the earliest settlers knew.

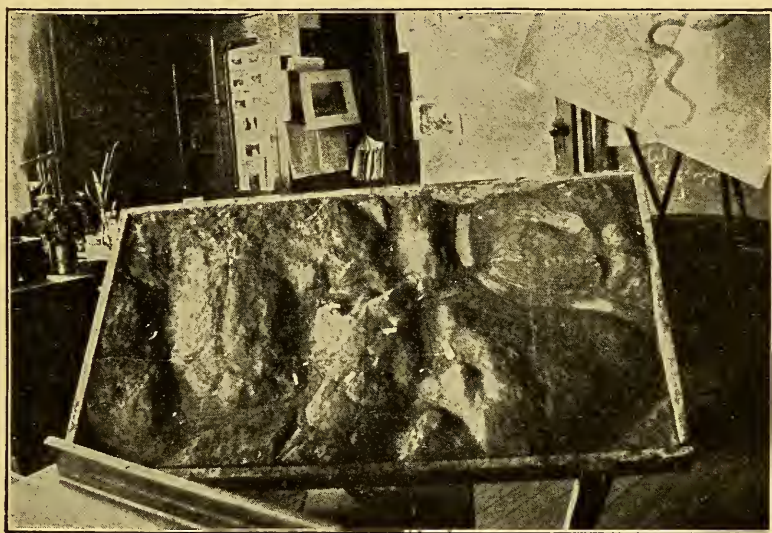
List the rivers, lakes and mountains that have Indian names, and group them by regions and by the Indian stock from which they came. Similarly trace the Dutch names of streams, hills, and towns between the Connecticut and the Delaware; the few Swedish names along the lower Delaware; and the French, German and Scotch names of counties and towns in the Carolinas.

In this work great help may be had from Bulletin No. 197 of the United States Geological Survey: "The Origin of Certain Place Names in the United States," by Gannett.

We also recall the geology of the section as far as the children have had it, and add to their knowledge many more definite points in the geology of the Appalachian Highland, the Piedmont Plateau, and the Coastal Plain.

Take the geological map of Pennsylvania and trace out on it the outcroppings of the greatest geologic ages. Now in cross-section east and west thru the Appalachians in Pennsylvania,

draw the chief strata in colored chalk on the blackboard on a large scale (an inch to a mile), representing the strata as they were formed before any erosion had occurred. The crests of the older Appalachians will then be represented as five inches high. The great coal veins will extend over nearly the whole state, in many places being higher than the highest crests are now. With the eraser wipe out all the parts that have been eroded in these



MODEL OF HOME REGION
(California on the Monongahela)

ages since the coal era. There will remain the cross-section of the Appalachians as they are to-day.*

Model the neighboring portion of the Monongahela Valley in sand or clay. The best material is the permanent plastic clay (Composite Modeling Wax) that remains soft and does not crack, furnished by F. W. Devoe & C. T. Raynolds Co., New York.

* Cf. Dryer's Physical Geography, p. 184.

Use the same scale for height as for horizontal measurement, say ten inches to the mile, or, if preferred, take twenty centimeters to a kilometer. This will show an area about three to four miles square centering about the home town, and should be constantly at hand for reference to type features of physiography.

We have great help from a working model of a flowing river that is eroding its bed thru six feet of rock, sand, clay, coal, soil, and slate, from a lake where it rises in the mountains down over cascades and windings to the coastal plain and delta at the seashore.

The physical features of this "Land of Lilliput" are named, and maps showing the changes in flood and drouth are drawn. The Lion River rises in Little Bear Lake, whose source is the Sand Spring in the side of Badger Mountain. The chain of the Horseshoe Mountains nearly surrounds the lake. A few centimeters from the lake the Lion River plunges over Bubble Falls into the pool below, and then begins its course of washing down the valley.

At flood time the river fills its valley from hillside to hillside, but in the drier time, when Bubble Falls only sparkle their beaded streamlets, the Lion River is a modest little stream cutting down its flood plain in a single narrow bed.

On this wide alluvial plain Rankey's trial took place. Northeast, beyond the Beaverback Mountains, is the desert called Hufferslow, and "the miry swamp, hight Quarrelpit, is in the very midst of it." Here the ground water oozes up from the sandy soil whenever Little Bear Lake has water in it. A spring from the west side of the Horseshoe Mountains forms a branch of the Lion River.

A little farther down the stream is an old lake bottom thru which the Lion is carving its channel. The river formerly flowed into the east side of the old lake and then issued from its south

corner; but now the stream has washed into the outer shore so far as to undermine the narrow ridge of the Kamisura and has broken thru, making an underground river for a short distance. Where it again comes to the surface it is near Malpertouse, Reynard's castle. In the vicinity are numerous caves, and about two decimeters down the stream beyond the next bend is Smugglers' Cove, just fifteen centimeters from the delta lands of the mouth of the Lion.

Here the left bank is steep, leading upward to a triangular plateau, the meeting place of the animals. From the plateau looking to the north we can see Rustyfile's place with the oak log in the front yard. Near by another branch joins the Lion River.

The delta formation shows all the characteristics of the Mississippi delta, pushing out into the Gulf of Mexico. It has three branches, in each of which the stream washes out its channel, except at high flood, when everything is covered with water at the delta and the soft alluvial deposit is rapidly carried away.

The old stream issuing from the old lake cut down its valley to the coal beds, exposing the coal vein on both sides of the stream as the Monongahela has done.

The two heights of water in the ocean into which the Lion River flows illustrate the tides. Eddies, currents in the river, lake, and ocean; whirlpools at the bends; the carrying of silt and the heavier sand down the stream; the wearing away of the outer bank, and the forming of a sand-bar on the inner bank of every bend, are all shown clearly in ever changing phases.

The soil and rock are prepared in strata and faults, outcrops and tiltings, so that the Lion River may find its life-history as similar as possible to that of its giant brothers of the earth.

The great advantage over the sand model is that here the river makes its own bed; it is active and moving, changing and "going on forever." It has the fresh interest of a living animal. Its

eddies are like thoughts that indicate a changing purpose; it seems pulsating with life, murmuring and babbling over its gravelly bed.

Treat the products from the standpoint of history of the colonies. Thus the early importance of the tobacco in Virginia, of the rice and indigo in the Carolinas, of the furs in New York, serve to give a perspective to the industrial development and contrast with the great staples of the present — dairy products in New York; iron and textiles in New York and Pennsylvania; fruits and gardening in New York, Maryland, New Jersey, and Delaware; tobacco and cotton in Virginia and the Carolinas. Make very plain the importance of the Fall Line and trace it thru all the states.

Teach the local conditions that center the great industries in particular regions, as the iron and steel industry in the Pittsburgh district; glass-making near Pittsburgh and Wheeling; the manufacture of pottery and bricks near Trenton and Philadelphia; the tobacco industry at Richmond; the manufacture of steel ships and woolens at Philadelphia; cotton raising in the Piedmont Plateau, and rice culture in the Carolina swamps.

Read from the daily papers of the shipwrecks and rescues off the Carolina coast, Cape Fear, Cape Look Out, Cape Hatteras, Fire Island, Nantucket, and Cape Race.

Recall what was studied in the fourth grade about the early trips across the mountains by Gist, by Weiser, by Washington; the Indian trails in Pennsylvania, New York, and Virginia; what has been learned in other grades of the Hudson-Champlain route to Canada, the Mohawk-Oswego route. Mark out on the floor map the great transportation routes across the Appalachians and trace their influence in locating the population and the industries.

Thus treat the New York Central Railroad and Erie Canal, the Pennsylvania Central, the Baltimore and Ohio, and the

Chesapeake and Ohio. Get the advertising matter and timetables of these railroad companies, and be sure that the towns along the routes are well associated with the routes and the industries of the sections.

What merchandise will be sent east and what will be sent west by each route?

Why have the earlier canals usually been superseded by railroads?

Note that now all but one of these great trunk lines reach New York. Why is that?

Why does the Erie Canal continue to be important after the abandonment of so many other canals?

Make type studies of the following: the oyster fisheries; coal-mining; a blast-furnace; Pittsburg as a trade center; oil and natural gas; tobacco in Virginia; New York city as the great port and metropolis of the country; shipbuilding on the Delaware; Washington as the seat of government.

HISTORY AND LITERATURE

DURING January we follow the settlement of the Atlantic Coast from the Hudson to Spanish Florida.

Recall the unsuccessful attempts at colonization at Fort Caroline and at Roanoke Island. Why were these settlements failures? Their fate illustrates the importance of the destruction of the Spanish naval power before successful colonies could be planted in America by either France or England. "The defeat of the Invincible Armada was the opening event in the history of the United States. It was the event that made all the rest possible. Without it the attempts at Jamestown and Plymouth could hardly have had more success than the attempt at Roanoke Island." *

* Fiske, "Old Virginia and Her Neighbors," Vol. I, Chap. I.

Raleigh's importance in our early colonial history is due as much to his part in the defeat of the Spanish navy as to his attempts at Roanoke. With the close of the sixteenth century and the beginning of the seventeenth century England controlled the ocean routes to America, and her line of communication with the infant colonies was safe from interruption. Then began the successful colonization by England at Jamestown in 1607, and at Plymouth in 1620.

On the floor map mark out in chalk the three zones as defined in the Virginia charters of 1606 and 1609. Make clear to the children, however, that this petty device on the part of King James to quicken the settlement of the colonies has happened to coincide with the very important division of our coast into New England, the Middle Colonies, and the Southern Colonies; but that the characteristics of these three divisions are due to differences, first, in the character and purposes of the early settlers of the three zones; secondly, in the form of local self-government; thirdly, in the physiography of the regions; and fourthly, in the resulting local industries. These points should become clear thru the concrete facts as the study of the settlements proceeds.

How characteristic of this period it is for England and Holland to colonize by a commercial joint-stock company! But such a method soon proved its weakness. Colonizing at the beginning of the seventeenth century was all an experiment, without previous experience to guide the promoters. Their mistakes and failures, if rightly understood, are as valuable for us to study as their successes. Do not, then, too lightly pass by such matters as the intrigues of Spain against the infant colony, the search for the Sea of Verrazano or some way thru to the Pacific Ocean, the hunting for gold and diamonds, the attempt at communism, the starving time in the winter of 1609-1610, the extremely precarious relations with the savage Indians, the difficulties of

raising or of purchasing enough food and other necessities of life in the wilderness, the development of tobacco-raising, the beginning of slavery in America, the growth of self-government in Virginia, the coming of the cavaliers, the receding of the frontier, and the resistance to Berkeley's tyranny.

Fiske gives some interesting statistics of the increase in population and the development of the tobacco industry.

Many of the geographical names are redolent of historical association — Jamestown, James River, Capes Charles and Henry, Newport News, Point Comfort, Hampton Roads, Delaware River.

The various forms of governing the Virginia colony and the modified attempts in the case of the other colonies will be most intelligible if the facts be presented as actual experiments (for they were such) in the solution of the problem of governing colonies. Such a study is the best course in civics that we can devise. Do not deal in abstract generalities; everywhere use the concrete facts and fill out the details of actual life.

The early history of North Carolina is the story of the receding frontier moving southward from the settlements on the James River. The course of this movement, with its rough life and turbulent lawlessness, was powerfully modified by the immigration of sturdy Huguenots after the Revocation of the Edict of Nantes, of hard-headed Germans from the Rhenish Palatinate after its barbarous devastation by the troops of Louis XIV, of Scotch-Irish from Ulster after 1719, and of Scotch Highlanders in 1745 after the suppression of the Jacobite rebellion.

In South Carolina similar elements were mingled, but in different proportions.

Society was very different in the two colonies, in South Carolina being closely centered in Charleston and strongly aristocratic, while it was more democratic in North Carolina, and scattered. The South Carolina planters grew rich by cultivating

rice and indigo; in North Carolina the products were mainly tobacco, corn and rice from small farms, and lumber, tar and turpentine from the splendid forests of yellow pine. In North Carolina "the typical picture is that of a few black men raising tobacco and corn on the small plantation where the master lives." In South Carolina "it is that of an immense gang toiling in a rice swamp under the lash of an overseer." About 1760 the inhabitants of North Carolina were reckoned at 200,000, of whom one-fourth were slaves; those of South Carolina at 150,000, of whom nearly or quite three-fourths were slaves.*

Mark on the floor map the Fall Line and have the children realize that it represents the western frontier for all the colonies from Virginia to Georgia in the eighteenth century. It is, then, only the lowlands near the coast that the colonists have settled up to this time. Later, these diversities in the coast regions were not continued into the uplands, so that the Piedmont belt of these South Atlantic States presents a much more homogeneous picture both as a frontier and later as a settled agricultural region with its great staple, cotton.

Georgia was established for the twofold purpose of freeing insolvent debtors who crowded English prisons and of establishing a strong military outpost that might serve as a buffer against the Spaniards.

Fill in these sketchy outlines with abundance of life and blood detail. Remember that people are interested in life and can easily enough generalize from the concrete when they have the right concrete impressions as a basis for thinking. The chief difficulty in teaching history is to avoid wrong generalizations from false concrete images. Fiske's "Old Virginia and Her Neighbors" is an admirable account for the satisfactory treat-

* Fiske, "Old Virginia and Her Neighbors," Vol. II, Chap. XV.

ment of these southern colonists. The teacher should be familiar with its contents and draw from its rich wealth of facts. The compendious school-texts are fit only for use in review after the teacher has first presented the living picture and stirred the hearts and the imaginations of the pupils.

Maryland was the first of the proprietary governments, and may well serve as our type in studying them. After Plymouth and Massachusetts Bay it was the first settlement planned as a refuge for the persecuted. It was the first colony that offered a limited toleration in religion. In industries it resembled both Virginia on the one hand and Pennsylvania on the other.

A pretty full account of the life of Henry Hudson is needed,* to fix in mind the connections of events in the beginning of the seventeenth century. Hudson was the Nansen of his time, and had already become famous for his voyages into the Arctic waters in search of the pole and a north-of-Europe route to India. The Dutch engaged him in their service for a further attempt, and he set out for Nova Zembla in a little yacht of eighty tons burden with a crew of only sixteen or eighteen men. (Fiske.) He had tried passing directly thru the Polar Sea, and on the second voyage had tried the route between Nova Zembla and Spitzbergen; now he found himself again baffled in the attempt to cut his way thru the ice and get thru to the northeast.

Captain John Smith, who had explored the Chesapeake in the preceding summer, had written to Hudson about his own fruitless search for a strait to the Sea of Verrazano and suggested that the passage westward might be found a little farther north. Hudson, with Smith's letter in his pocket, instead of returning to Amsterdam as his instructions bade him, turned southwest and skirted along the American coast, stopping at Penobscot Bay, Cape Cod, and Delaware Bay, and finally dropped anchor at Sandy Hook,

* See Fiske, "The Dutch and Quaker Colonies," Vol. I, Chap. III.

determined to search for a westerly route, as Columbus had done when the easterly route proved impracticable. It is only when one grasps these facts with the accompanying details that one becomes interested or understands the men and their motives. "Smith was the savior of Virginia, he gave to New England its name, and he was instrumental in sending the Dutch to Manhattan!"

After Hudson returned to England, King James forbade him to go to Holland, and at once sent him out on another voyage in search of the Northwest Passage, in the course of which his mutinous crew set him adrift in an open boat in the great sea that has ever since been known as Hudson's Bay. Most explorers accomplish more than they do not aim at than they accomplish of what they do aim at. Hudson was a successor to Columbus in the search for a westerly route to India, but he started two immense industries, the Spitzbergen whale-fisheries and the Hudson Bay fur-trade; and he brought the Dutch to Manhattan Island.

Recall the work of the previous grade on the Indian fur-trade. Follow up the commercial enterprise of the Dutch on the Hudson under the Dutch governors, and see why New Netherland failed to attract settlers as fast as the English colonies in Virginia, Maryland, and New England.

Typical tho somewhat distorted as caricature, "Knickerbocker's History of New York" may well be drawn on for supplementary reading. Many of the scenes may best be thrown into dialog form and acted out with Dutch dress and improvised articles of Dutch housekeeping. The girls will be delighted to dress their dolls up as Peter Stuyvesant, or act out the "Cares of the Huysvrouw," as told by Helen Evertson Smith in her charming "Colonial Days and Ways" (Century Company).

In dealing with colonial life it is necessary to remember that not only were the several colonies very different in social man-

ners and material comforts, but there was a very marked and rapid improvement from decade to decade thru the seventeenth and eighteenth centuries in all the colonies, as indeed there was thruout Europe, too.

Our pupils would know fewer things that are not true if we were less eager to hurry them along to generalizations and opinions for which they are unripe, and if we would in the place of these give the children that fullness of actual life details that leaves an indelible and therefore always serviceable mental picture to be used in the thinking of all the later years. The bald statements of the text and the teacher are responsible for the fact that perhaps more than half of all that is taught is forgotten before the year is out, and of the remnant remembered less than half is unperturbed from the truth. How little of the sacred flame of interest has been enkindled!

Why did the Dutch of New Netherland welcome the transfer of sovereignty to England in 1664? If the life under the Dutch governors has been pictured with any approach to reality, the children will naturally sympathize with the inhabitants in their action. But did the colonists get the reforms in government that they expected? The overthrow of Andros and Leisler's Rebellion are part of the answer.

What facts made New York of commanding importance to the English in 1664? The greatness of this commonwealth dates from a period subsequent to the Revolution. It was not till the movement of New Englanders westward thru the Mohawk Valley and the opening of the Erie Canal in 1825 that the Empire State came to be recognized as the leading state in the Union.

Thruout the colonial period the fur-trade was always the controlling interest. Show why this trade reached New York more than New England or Pennsylvania.

Here is, perhaps, the best place to treat that very interesting and really important colonial topic, the piracy along the Ameri-

can coast. It would be well to teach the related subjects from Drake's and Hawkins's exploits against Spanish treasure ships, the Navigation Acts and the suppression of manufactures in the colonies, the smuggling, the kidnaping of white persons in England and the stealing of negroes in Africa, down to the stirring careers of Blackbeard and Captain Kidd.

It is worth while to realize vividly what these things mean, and to know how these false aims flourished, in order to get a perspective of the moral development thru the centuries. Community life and national existence are on a much higher plane now than they were two or three centuries ago.

The English settlement of New Jersey, Delaware and Pennsylvania may best be treated together. The founding of Pennsylvania deserves a pretty detailed study, as the culmination in the century's experiment in colonization. William Penn undoubtedly did endeavor to profit by the experience of the other colonies in making his "Holy Experiment" a success. In large measure he succeeded. Absolute freedom of conscience was guaranteed to everybody. Governments exist for the sake of the people, declared Penn, and not the people for the sake of the government. This principle he tried to follow out in his Frame of Government. In penal legislation, the reformation of the criminal was held to be a worthier object than the wreaking of vengeance. The Philadelphia prisons came to be known as the best in the world. The famous Shackamaxon Treaty with the Delawares, "the only treaty between Savages and Christians that was never sworn to and that was never broken," forms one of the brightest features of our colonial history.

When the Scotch-Irish and the Germans from the Palatinate began coming in large numbers to America, they entered in greater number into Pennsylvania than into any other colony; so great was its fame and reputation abroad. They went westward into the mountains beyond the Susquehanna, and then in

large numbers passed southwestwardly thru the Great Valley into the southern colonies. Pennsylvania has been the "chief center of diffusion of the people who became afterward the pioneers of the democratic West." (Fiske.)

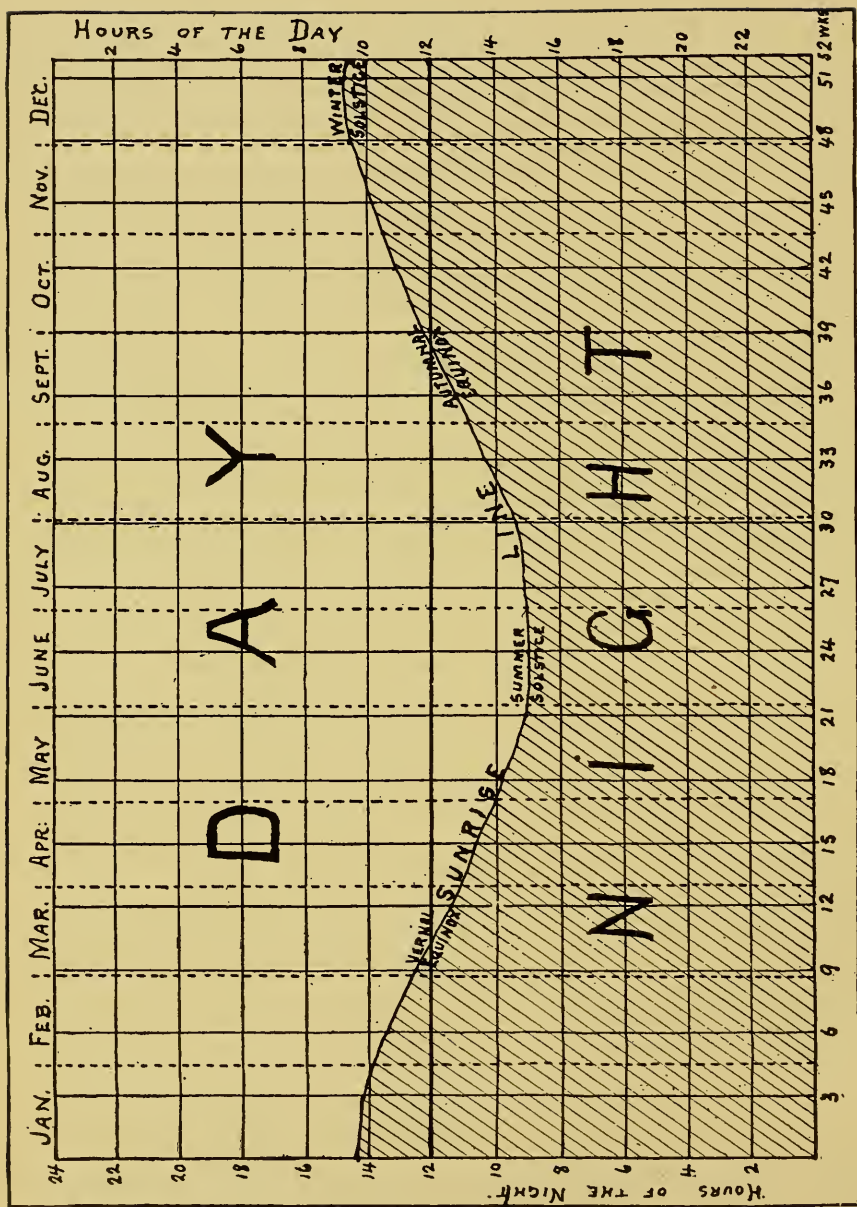
One of Fiske's most interesting chapters in his "Dutch and Quaker Colonies" is entitled "The Migrations of the Sects." In it he traces the causes of the Huguenot exodus from France, the German outpouring from the Palatinate, the flight of the Jews from Spain and the Netherlands, that of the Scotch-Irish from Ulster, and recounts their settlements in the colonies, recalling in many cases the marks they have left in local names, or the parts they have played in our later history.

In class treatment this matter might best be taken as a review with the new facts added by the teacher. Thus, after detailing the atrocious policy of Louis XIV toward the Huguenots, the teacher may put questions: Which colony will be most likely to attract them? Why so? Why not New England? Full answers will recall the facts of social and industrial development as well as those of political and religious freedom. Considerations of climate also affected their choice of region in which to settle. New England did receive a good many Huguenots. What marks have they left in names or deeds in New England? Speak of Faneuil Hall, Bowdoin Square, the Olneys and Dabneys, etc. New York shows more marks — Desbrosses Street, New Rochelle, the Jays and Laurens, etc. South Carolina received many more.

NUMBER

ENLARGE the map of the Middle Atlantic States to double its size in the same manner as the enlargement of the map of the Southern States was carried out last month.

Make a day and night chart for the year like the following:



Problems in foods will facilitate the cooking class and bring out the ratios of the elementary constituents in the common articles of diet. It would be best to represent these percentages by measurements on the sides of square rods whose length represents 100 per cent.

Calculate the density of population to the square mile in each of the Middle Atlantic States. Find the total population of the section and the density of population for the whole section. List all towns with over 10,000 people in the order of their size.

Teach the extraction of the square root and then have charts prepared to represent the relative size of towns by circles. For this purpose extract the square root of the number representing the population. Use the scale of one thousand to eight units of the square root. Find the radius of the circle in each case by dividing the square root of the population by eight. The quotient will be the number of millimeters in the radius. Construct the circles and fill in the area of the circle with India ink, or cut out the circles and print the names of the towns on them.

If the method of representation is continued for all the other cities of the country, the cut-out circles will be best, since they will be more easily handled and compared. These circles may have pictures of scenes in the cities pasted on them, or facts and statistics printed on them. Of course if larger circles are wanted for this purpose, use a larger scale; one millimeter to every four units of the square root of the population. When these circles are all ready for the whole United States, a favorite exercise with the children is to place each at its proper position on the floor map.

In the Mines and Metallurgy Building of the Louisiana Purchase Exposition the following statistics were presented by Pennsylvania:

ANTHRACITE DISTRICT.	ORIGINALLY, TONS	ALREADY MINED, TONS
Lehigh	1,600,000,000	602,775,645
Schuylkill	12,200,000,000	1,194,591,185
Wyoming	5,700,000,000	1,819,691,875

How many tons remain unmined in each of the three great anthracite coal districts?

What is the total number of tons of anthracite estimated to have been in Pennsylvania?

How many tons in total have been mined?

How many tons remain yet unmined in the state?

If it is practicable to mine 60 per cent of the original coal, how many tons may yet be mined in each of the three regions?

What per cent of the coal in each of the three districts has been mined?

What per cent of the coal that may be mined has already been mined?

Make wooden cubes to represent these quantities of coal, using the scale of one cubic millimeter to represent one thousand tons of coal. This will involve the extraction of the cube root. It may be best for the present to do this for the pupils and not attempt to teach the process in this grade. When the cubes are made, paint them coal black and on each, in white paint, put the quantity that it represents.

In Macfarlane's "The World's Commerce and American Industries," published by the Philadelphia Commercial Museum, 1903, will be found much valuable statistical material graphically presented in chart form. In the new Statistical Atlas of the Twelfth Census, published by the Census Bureau, there is a great wealth of chart, map, and diagram presentation of the statistics of the last census.

The teacher can readily choose or adapt what is wanted from these rich mines of material. But in any case, such material should be chosen as is needed by the interests of the children to make definite their mental images in nature study, weather,

geography, or some other study. If processes in these problems require drill for familiarity and rapidity, do not hesitate to give it. The pupil in the elementary grades should never look upon his mathematics as a body of knowledge learned for its own sake, but always as a method of reducing to exactness in measurement his concepts of the material world.

LANGUAGE

IN ALL the work thruout the year hold up the ideal of saying much in few words. Aim at simple constructions and short sentences. In condensing, however, do not omit important thought.

We lose a great deal of time and waste energy by not having the pupils correct their own or one another's papers. Re-writing the thought in other and better form is for them more valuable than to rush on to ever new thought. Struggling with the form of thought and modeling it into better form is the best practice. Here the teacher's part will consist in suggesting where and how to make changes, by combining here and separating there, indicating connection by a proper conjunction, condensing by the use of a more appropriate word, re-arranging the order of thought to follow a simpler plan, turning the account into direct discourse, punctuating or paragraphing differently, etc.

In enlarging the vocabulary of the pupils, do not teach definitions. Teach the children to use the words correctly by using them yourself frequently in the lesson, asking and answering questions that involve the use of the expressions to be learned. In many cases a child will hesitate to use an expression simply because it sounds unfamiliar to him. If, however, he has the sound ringing in his ears, he will inevitably fall into its use. Teach the spelling in connection with all new expres-

sions. Sometimes what is most needed is simply practice in pronunciation till the child knows the sound familiarly.

For January the Atlases may contain condensed accounts of the settlement of each colony south of the Connecticut; letters from a colonist in one colony to a friend in another colony; correspondence between members of a family, part of whom have settled in Pennsylvania, leaving others in England or Ireland or the German Palatinate; lists of articles we use every day that the people in none of the colonies had; description of life in Jamestown with Capt. John Smith, with Nathaniel Bacon, in Charleston in the pirate days, in St. Mary's when it was the capital of Maryland, in New Amsterdam with Peter the Headstrong, in Philadelphia with William Penn; the enlarged map of the Middle Atlantic States; the map of the colonies with boundaries as they were in 1675, and another map to show the boundaries and additions till the peace of Utrecht; a list of the additions to knowledge of North America made between 1600 and 1700; papers on the chief industries of the Middle Atlantic States; charts showing statistics of the Middle Atlantic States; the diagram of the day's length thruout the year; a paper on foods, including also the nature of stimulants and their abuse; and a great many pictures. All the written papers should be illustrated. The pictures will include scenes in the different colonies, old colonial furniture, tools, dress, ships, houses at Jamestown and at New Amsterdam, scenes on the Virginia plantations, William Penn's Treaty with the Indians, a birdseye view of New Amsterdam from the English ships as they come to anchor near Governor's Island, Sept. 4, 1664, etc.

GRAMMAR

The use of the infinitive as a noun claims our attention in January. The simplest construction is that with the infinitive

as subject of the finite verb. In the other construction the infinitive is in the predicate as an object complement. Bring out clearly its noun nature, the *name* of the act or state of being denoted by the verb from which the infinitive is derived. The infinitive is a form to be used in a noun construction. The word "to" before the simple verb form is called the sign of the infinitive. In the constructions for January this sign is always present.

Use no definitions, but teach everything by example and use. Let the questions always refer to actual sentences.

It is a very good plan to have the infinitives picked out in a selection from the reading book till the children get used to the form and the name. The general notion develops of itself if instances enough are provided.

THE ARTS

MUSIC

THE songs for the month are "Ring out, Wild Bells," "Kind Words Can Never Die," "Abide with Me," "O Come, Come Away." The difficulties in these songs will furnish the exercises for the month. All the old songs must be kept fresh by frequent rehearsal as occasions may offer.

In beating time to the singing, do not beat time like a metronome; but let the movement gesture the note and symbolize the singing. It is well, too, for the children to join in appropriate movements or gestures to accompany the songs.

The exercise known as spelling and pronouncing chords is excellent to familiarize with the different chords: Divide the class into three parts; let section one hold *do*, section two hold *mi*, section three hold *sol*. Let the first section hold *sol*, the second section hold *ti*, and the third section hold *re*. Sing all

the chords similarly. This may be made more difficult by using the syllable "la" or "ah" in place of the scale names.

Let the children write songs from memory after learning to sing them. Have them transpose to different keys.

Frequently give an exercise like this: Write the notes on the staff for the key of C, and sing them, using the syllable names. Add one sharp to the signature, and now sing them. Add two sharps, three sharps, four sharps; one flat, two flats, three flats, and four flats, and sing, using the proper syllable names.

A frequent use of Dr. Palmer's Modulator will be of great value in fixing the scale intervals and training to keep the pitch.

Continue the ear-training in major and minor exercises. Begin the writing of relative minor scales.

In written tests do not ask for definitions. Let the directions be such as the following:

1. Write the scale in the key of D. Indicate that it is to be sung very softly and slowly.
2. Write four measures in $\frac{3}{4}$ time, using half-note, quarter-note, and eighth-note; key of F.
3. Insert the bars in a given piece of music to correspond with the time signature.
4. Write the following tones in the key of B-flat: 5, 6, 5, 1, 2, 1, 1, 7, 1, 6, 4, 5, 3, 1.
5. Write the chromatic scale beginning with C.

If possible at all give the children the opportunity of hearing artistic singing by invited soloists.

DRAWING

Outline drawing for purposes of illustration, as I have been advocating it, bears the same relation to art training that simple English prose composition or conversational English

bears to training in a literary career as a poet, historian, or novelist. If we drop the waste of time on the idle frills of so-called art instruction, we shall thereby gain time for the basis of all, which is practice in free-hand drawing that secures manual training in grace and accuracy, and eye-training to see distinctly and treasure up visual images. This is within the reach of all, just as is the use of prose English.

Each month several objects should be chosen for special drill practice in drawing from different points of view, and the practice should be continued till they can be drawn correctly in any position from memory. Thus give a week or two to practice on a horse, or dog, or chicken, or boat, or house, or tree, or landscape. This practice drill must of course be made from the object itself, or from mounted animals or plaster casts. Of course without these, practice may be had on the human figure and other common objects that are at hand, but choice is then more restricted and inconvenient.

As a special point to clear up let simple perspective claim our attention for a while. For this purpose have interiors of rooms or exteriors of houses drawn where the converging parallels are numerous. There is really no difficulty at all in learning perspective, but one must have experience and practice to be able to use perspective correctly in memory drawings.

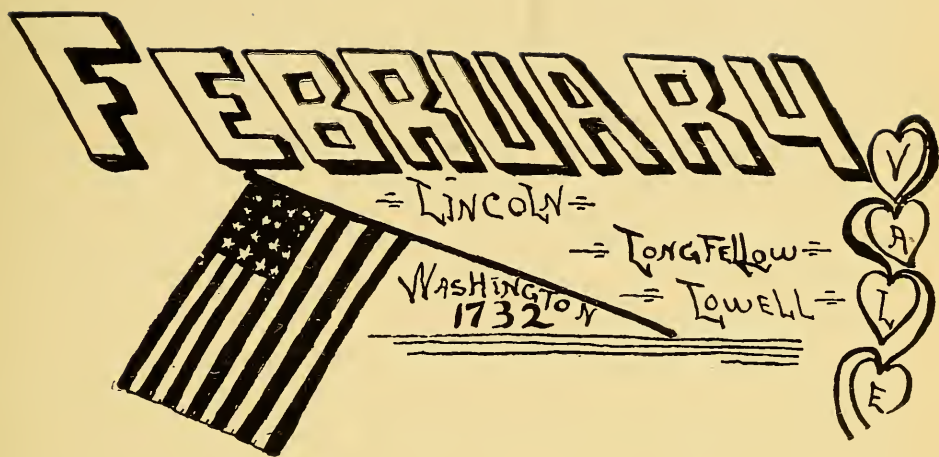
MAKING

Make clay or sand models of Jamestown, New Amsterdam, Charleston, Philadelphia, to as large a scale as possible on the sand table. Pasteboard houses filled with plaster-of-paris and painted on the outside to show windows, doors, stone, shingle roof, logs, portico, or other features look well, and stay in their places and retain their shape. Be sure to keep the same scale in representing all parts of your settlement. Pieces of colored

sponge stuck on wire or sticks make very good-looking trees, while finely cut bits of paper or very short bits of coarse hair thickly sprinkled over meadows wet with glue and afterward covered with green paint readily suggest grass or weeds and bushes.

Model similarly a Virginia tobacco plantation on the James. Make a Dutch house as large and in as much detail as your time will permit you to finish.

Make and cut out paper dolls to represent the colonists.



NATURE STUDY

IN FEBRUARY make a special study of some of the animal communities, as, for example, an ants' nest or a bee-hive. In order to have in the schoolroom an ants' nest in working order in February, it must be prepared carefully in the autumn and tended during the winter months. The most convenient nest is made of cement covered with glass. This allows all the activities of the creatures to be readily observed thru the glass top, without affording the ants any opportunity to escape. When not under observation the nest should be covered with black cloth to exclude the light.

Be sure to secure a whole colony of the ants, or their life activities will be incomplete and the work unsatisfactory. They need more or less moisture, and may be fed on syrup, candy, bread crumbs, or sugar. If the nest is properly managed, you

will have a most fascinating presentation of an insect community, with storehouse, nursery, general dump for rubbish, and the open runway of the burrow. While there are any pupas to attend to, they absorb the interest of the ants and receive constant and anxious attention.

For fuller directions as to managing ants' nests, see Hodge's "Nature Study and Life," Comstock's "Insect Life," and Jordan & Kellogg's "Animal Life." Lubbock's "Ants, Bees, and Wasps" gives a very faithful account of painstaking experiments with ants, and many of the devices used are applicable to the schoolroom.

If the ants' nest or bee-hive is impracticable for your work in February, make a card catalog collection of insect pictures arranged systematically by families and orders. Beautiful colored plates of many butterflies and moths, beetles and grasshoppers are easily available, and these, with many more woodcuts and half-tones, may be pasted on cards of a uniform size, and all arranged systematically by orders, families, and genera. Such a collection is very easily managed, and is much more easily preserved and handled than a collection of dried specimens, while it is almost as serviceable for purposes of identification and survey.

With such a survey collection the eyes will be sharper on the lookout when the spring opens and insects begin their new year. For reference in this systematic work the best book will be found to be Comstock's "A Manual for the Study of Insects," published by the Comstock Publishing Company, Ithaca, N. Y.

In February and March the children should make a collection of the cocoons, chrysalids, and other winter stages of insects, and put them in insect cages ready to hatch out in the warm.

Our other topic for February is hygiene. It is intended to

gather together here in the month all the important points to which children should have their attention directed in regard to care of their health: The function of the skin; the influence of dress; the need of bathing; the care of the teeth; the purpose of food; the nature of stimulants, and the evil influence of alcohol and tobacco; the physiology of breathing; the hygiene with exercises to secure deep breathing; ventilation; posture in sitting and standing; what to do in case of accident, fainting, fire, or drowning; how a community helps to stamp out scarlet fever, smallpox, diphtheria, measles, or other epidemic; the importance of forming good hygienic habits that give a robustness to the health, a clear head, and a light heart; the value of good, simple food, regular meals, plenty of sound sleep, pure air and deep breathing, pure water and plenty of it, sunshine and life in the open air.

WEATHER RECORD

Besides continuing our daily record and following on the floor map the daily weather conditions as reported by the Government Weather Map, we find it desirable to give additional time in February to the tracing of the course of the Highs and Lows across the country. Recall the whirlwind character of the Low and its suction tendency, and the reverse character of the High with its scattering tendency. Use the terms Cyclone and Anticyclone, for these whirling areas of wind.

From the weather maps read off the position of the Low, beginning with the first appearance of one on the Montana border and following it on successive days in its broad sweep to the southeast and then down the Valley of the St. Lawrence. Let its position each day be represented by one of the boys standing on that spot of the floor map. Similarly have the

successive positions of the High marked by girls standing on the map. Have others in the class describe in words very accurately this course of the High or Low as it moved across the country. Trace a dozen or more such cyclone and anti-cyclone movements across the country. Of course include the storm-centers that come up from the Gulf of Mexico as well.

If each path thus represented be marked on the floor map in chalk, we shall have a graphic diagram of the general course of storms. Finish up the work by having a careful statement made of the origin of the storms and their general course across the United States.

If the weather map comes to your school, you can have colored flags made to correspond with those used by the Weather Bureau, and with these you can signal the weather indications to all within sight of your school.

GEOGRAPHY

THE geography work for February embraces New England and the Valley of the St. Lawrence.

Study first the physiographic features that the Indians and the early French and English explorers and fur-traders and settlers knew. List the prominent Indian names of lakes, rivers, and mountains; the French towns, lakes and rivers, mountains and islands; and the most important English names. On the floor map chalk in the water-sheds and bound the river valleys. Mark the head of navigation on each river. Note the good harbors and learn their names.

Why are there so many lakes in this region? We found none south of Pennsylvania, and few in that state except in the extreme northern corners.

What has made so many waterfalls?

Are the mountains very old, or have they not been worn down very much since they were formed?

What changes have caused these good harbors?

Contrast with the Carolina coast.

Each of these topics should be pretty thoroly treated. In case of a February thaw and warm spell that sends the ice and snow off in little rivers and lakes with miniature waterfalls bubbling over moraines left by the thawing "ice-sheet," the story of the great Ice Age may be made very real and clear. If no such thaw comes in February, utilize it whenever it does come in March or April. If you are in the city and cannot see the annual "ice age" repeating its story undisturbed by human agency, then demonstrate the main points on the sand table by thawing out a mass of dirty snow and noting the resulting physiographic features.

If the "Land of Lilliput" be covered with a mass of dirty, wet snow and be allowed to freeze, it will illustrate the Ice Age in North America very well. When brought again into the schoolroom, the great glacier will melt and deposit moraines, form rivers, lakes, waterfalls, and islands. The grinding, scraping and gouging of the glacier may be illustrated by the action of the wet snow flowing off from the top of the snow heap before we let it freeze solid. The rising and sinking of the coast and so the formation of drowned river valleys may be charmingly illustrated at the mouth of the "Lion River."

This region of southeastern Canada and New England was all covered with forest when the settlers came, and the lumber products have been an important item ever since. Treat the related topics of sawmills, ship-building, paper mills, and the making of maple syrup. Make collections of pictures illustrating these industries, and arrange them in a book or paste them on a large outline map.

What rivers bring the logs down?

What cities are centers for the manufacture of articles from lumber?

Recall the study of the St. Lawrence River in the fourth grade and note the effect it has had in making a thorofare to the interior of the continent; while New England, New Brunswick and Nova Scotia have had to depend more on their own local resources for their commerce. Montreal and Quebec are ports for ocean steamships, and they ship grain and cattle and lumber and furs that come from the interior of the continent, as well as the products of lower Canada.

"In the middle of the eighteenth century, the entrances and clearances in the ports of Philadelphia and New York combined were just equal to those of Boston alone."* But the valleys of New England extend northward to the Canadian frontier instead of reaching westward thru the Appalachian barrier. The opening of the West and the digging of the Erie Canal have carried westward a New England migration and transferred the commercial supremacy from Boston to New York. Boston was the commercial metropolis as long as the center of population was east of the Alleghenies. Now, altho there are many other good harbors, the railroads dominate inland transportation and make Boston the port for New England, while the great trunk lines of the United States pour the foreign commerce of the great Middle West into New York, and those of Canada pour it down the St. Lawrence.

The decline of the old agriculture in New England, and the abandonment of the farms or the substitution of truck-farming, dairying and poultry-raising, have followed the expansion of the country to the westward and the development of the rich agriculture of the Mississippi Valley.

Read from the daily newspapers of the sufferings of the fishermen, and shipwrecks of the fishing vessels off the banks.

* Sample, "American History and Its Geographical Conditions," Chap. VII.

Mark on the floor map the chief manufacturing cities in New England, noting the reason for their growth, at the falls and at the head of navigation. Note conditions of obtaining the raw material for each of the chief manufactures, and the source of power. Scarcely any coal is mined in New England, but much is imported from Pennsylvania and Nova Scotia. The cotton manufactures of the South are increasing at the expense of those of New England. Which classes of manufactures are growing in New England?

Mark on the floor map the chief quarries for granite, marble, slate, and brownstone. Get samples of these and pictures of the quarries. In the pictures of New England buildings note the kind of stone and the nearest source of supply.

Study the cities and routes of travel with a Baedeker or other good and reliable guidebook at hand. Get the topographic sheets of the United States Geological Survey that belong to Massachusetts, Rhode Island, and Connecticut. By putting these together you will have a fine map, to the scale of one mile to the inch, showing the streets of the towns and such detail as will clearly individualize the places. This part of New England contains three-fourths of the population, and all the large towns. With Baedeker in hand plan trolley rides to places around Boston.

With the help of Baedeker's "Canada," tour Canada and see the sights. Make a specially full study of Montreal, as the commercial metropolis of Canada, and of Quebec with its quaint touches of the old days.

Halifax has a splendid harbor. Why has the town not developed into a great Canadian port, greater than Montreal?

HISTORY AND LITERATURE

DURING February we follow the settlement of New England by the English and of New France by the French.

Recall the early exploration along the North Atlantic coast from the Hudson northward to the St. Lawrence. Keep in mind the map of the time, with the Sea of Verrazano on it, and the narrow isthmus near the Chesapeake. Follow Captain John Smith, Cartier, and Champlain, noting the places they visited and the names that they added to the map.

Study the work of Champlain in the founding of New France, and the work of Bradford and Winthrop in the founding of New England. Bring out all the striking differences in the character of the two provinces.

Why were Plymouth and Boston stronger settlements than Quebec and Montréal?

Wherein lay the strength of the French manner of colonizing?

Why did the Algonkins fight the English but welcome the French?

Why were the Iroquois enemies of the French?

Treat the other New England colonies as offshoots from the Massachusetts colony, and emphasize the reasons for the dispersals. Why did the New England colonies all unite in 1643? Bring out pretty clearly the material difficulties that colonists had to meet in founding a state in a savage wilderness.

Just as tobacco supported the Chesapeake Bay settlements, and rice and indigo those in the Carolinas, so the New England colonists lived from their fisheries and their forests, while the French in Canada supported themselves by the fur-trade. Everywhere the French followed the rivers in their quest of peltries, and trafficked with the Indians. They seldom had any Indian wars for the very good reason that their trade was an

advantage to the Indians and did not take the land away from the aborigines. Their towns were frontier trading posts to which the Indians resorted for the very profitable exchange of goods. The French adapted themselves to the savage character and intermarried with the Indians, being adopted into their tribes.

Fiske shows very clearly how Indian politics led to the early fighting between the Mohawks and the French as allies of the Algonkins, and how this grew into a lasting deadly hatred on the part of the powerful Iroquois.

Why did not the Huguenots settle in New France as did the Puritans in New England? Point out differences in the treatment and policy by the mother country in each case.

“Thruout the colonial period and for the first four decades of the Republic the United States was dominated by the ocean.”* The center of population was on the Atlantic slope till after 1830. The Appalachian barrier stretched along the entire length of the English settlements. The French, on the other hand, followed up the great river that reaches to the heart of North America and so came to the interior of the continent.

The English came to make homes; they engaged in agriculture, fishing, and commerce; they felled the trees to make clearings, or for the lumber. For the English the Indians were so many wild animals encumbering the ground; the sooner the savage creatures were driven out the better. Exploration went but little faster than settlement; but whatever regions were once settled by the English became English territory for the future. They were to increase, while the French and Spanish were to decrease.

The French and Spanish spread thinly over an immense territory held chiefly in military possession, with but few homes

* Semple, “American History and Its Geographical Conditions,” Chap. VII.

and no local self-government. They sought to drain out the wealth of the land, for the mother country — the French thru the fur-trade and the Spanish thru the gold and silver. The reasons for the success of the English colonies and the failure of the French and Spanish should form one of the most important and fully treated topics for the month.

Compare also the several English colonies among themselves. Note the variations in the form of local self-government and act out the civil government by holding a Massachusetts town meeting. Let the acting out be a thoro lesson in civics, and take all the time necessary for it. Civics without history is almost unintelligible, and certainly misses much of the real motive for its study.

Read and commit Mrs. Hemans's "Landing of the Pilgrims," and portions of Whittier's poems on "The Merrimac River," his "Mountain Pictures," his "Trailing Arbutus," "Banished from Massachusetts," "Among the Hills," "Tent on the Beach," and "Snow-Bound."

It would be well to act out the dramatization of "The Courtship of Miles Standish," which was presented to the children in the Fourth School Year. Stanley Schell's "A Maid of Plymouth,"* is convenient and suggestive on costumes and acting. For details of dress and action, together with charm of face and figure, get the edition illustrated by Howard Chandler Christy.†

Read to the children from Kipling's *Jungle Books*. These books are admirable in giving the spirit of wild nature. They help us to picture and to feel the free, instinctive, merciless struggle for existence in the untamed life of the woods. It is with such conditions that the American colonists were brought into contact in the frontier settlements. In many ways Mowgli

* Published by E. S. Werner Co., 43 E. 19th St., New York City.

† Published by The Bobbs-Merrill Co., Indianapolis, Ind.

may be taken to represent the American Indian, or even a frontiersman.

NUMBER

ENLARGE the map of the New England States to double its size in the same manner as the enlargement of the previous sections has been carried out in the foregoing months.

Cut out squares representing one hundred square miles, and ten thousand square miles, using the scale of the floor map. These will be a square inch and a ten-inch square respectively. Cut out forty of the former and twenty of the latter. Place these on the floor map to measure the area of the different states. You will find it desirable to have also one-inch strips, two-inch strips, three-inch strips, four-inch strips, five-inch strips, etc., of different lengths to fill in the portions not covered by the larger squares. With these units measure the areas of all the states, of the principal river basins, and of the physiographic sections of the country.

With the cut-out states as helping material, estimate the relative size of pairs of states, judging by superposition. In this way take the ratio of each New England State to each of the other states of the country, and to each of the provinces in southeastern Canada.

Extract the square root of the area of each state and construct squares of Manila paper to represent such areas, using the scale of ten miles to an inch. Take the ratio of each New England State to each of the other states, using these squares as measurements. Compare similarly the area of the whole of New England with the area of each of the other states.

Continue the construction of circles to represent the population of cities as was begun in January.

Find what per cent of the total area of the United States is

contained in each state; in each section; in each drainage area.

Calculate the density of population in each New England State and in the adjoining Canadian Provinces; find the total population of New England and of the region formerly called New France.

LANGUAGE

RHYMING is a good exercise that trains in the choice of words more than prose writing does. Children delight in finding words that rhyme with others. With a little encouragement and a good deal of example they will enjoy making couplets and imitating the meters of poems they know. St. Valentine's Day may be made a source of inspiration for original poetry and pictures. In all this work let the most familiar subjects of everyday life, that the children are anyhow talking about, be chosen for the rhyming versification.

For February the Atlases may contain condensed (some may make them rhymed) accounts of the settlement of each of the New England colonies; an original play based on some episode in the colonial history, e. g., the Mayflower Compact, a children's party in colonial Massachusetts in 1636, or a town meeting; a story of the Great Rebellion in England and how it affected New England; the map of the New England Colonies in 1643 and in 1691; the enlarged map of the present New England States; papers on the chief industries of New England, the Ice Age, and the St. Lawrence River; a list of Indian, French, and English names of lakes, rivers, mountains and islands in New England and New France; papers on Boston, Providence, Montreal, and Quebec; a comparison of Champlain in New France with Bradford and Winthrop in New England; a record of observations on the ants' nest; and a paper on what to do to be strong and healthy. Most of these papers should be profusely illustrated.

Enlarge and combine drawings from different sources. Thus, arrange a colonial Massachusetts kitchen, making the fireplace of paper, and, where the articles themselves cannot be obtained nor made, draw on cardboard and cut out to represent spinning-wheels, ham and bacon and onions hanging from the rafters, a grandfather's clock, family portraits, a corner cupboard, etc.

GRAMMAR

For February we study the infinitive in adjective and adverb constructions. The difficulty lies essentially in recognizing promptly what the infinitive modifies. Present the matter in its simplest form always. Work thru illustrative examples instead of thru explanations or definitions. Grade the illustrations from those that are clear and free from puzzling doubts up to those that require more care and contain added difficulties. The use of the infinitive as attribute complement is plainly of the latter kind.

THE ARTS

MUSIC

THE songs for February are "The Blue Bells of Scotland," "The Battle Hymn of the Republic," and "My Old Kentucky Home."

Practice on the two-part singing daily. A convenient device to use in directing these exercises is the finger-scale notation. The teacher holds up the left hand with the fingers spread apart, each finger representing a line of the staff from E on the little finger to F above on the thumb. The open spaces between the fingers represent the spaces F, A, C, E, on the staff. With two fingers of the right hand the teacher can point to the positions



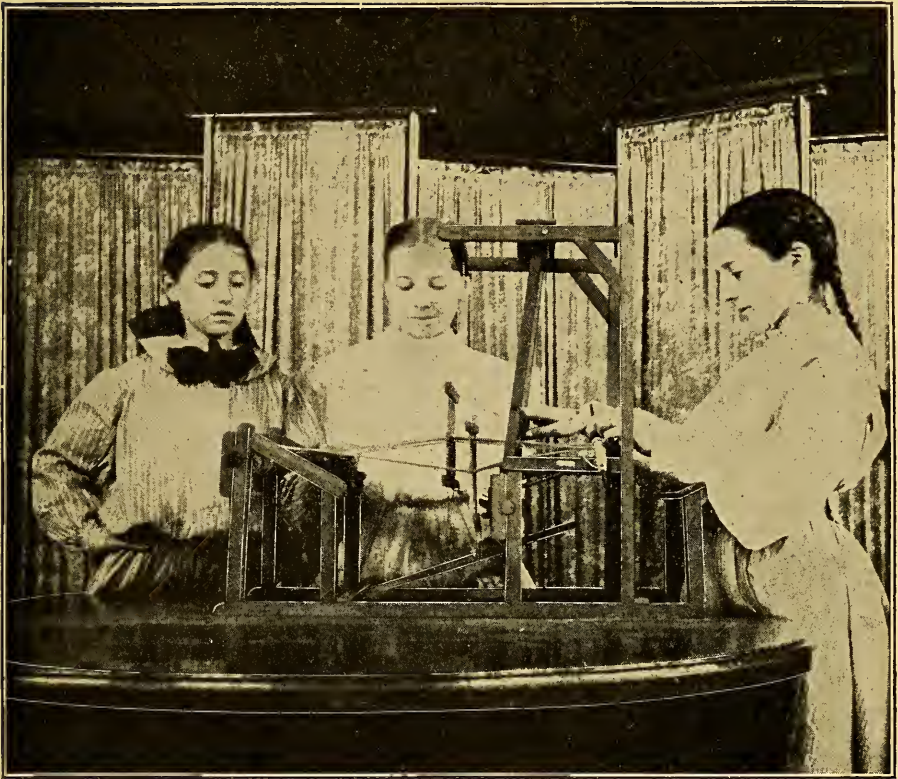
FINGER-SCALE NOTATION

indicating what notes each division is to sing and in this way carry out any exercise in two-part work without the interruption of a spoken word.

Hodges's "The Rose Bush" (chorus part) is well adapted to easy two-part work.

DRAWING

If outline drawing has been practiced in every recitation thru the previous months, the pupils may be allowed to do some brush work in water colors for February. They usually get the



WORKING MODEL OF OLD COLONIAL LOOM

fever in anticipation of St. Valentine's Day, and want to paint flowers and people for valentines.

Most of the color work that I have seen at the St. Louis Exposition and elsewhere in visiting schools is sham — a reaching after effect without mastering the difficulty. It requires vastly greater skill to handle the brush well than to draw with the pencil. I doubt thoroly whether the water-color work in the grades ever amounts to anything but a waste of time and an allurements to gaudy coloring at the expense of skill. In the outline drawing it is harder to sham off work that is unskillfully

done, and hence it is easier thru it to acquire the skill of putting shapes on paper.

If some of the pupils find they have a native ability in using the brush, the time will not have been wholly wasted; but they are the only ones that should continue to spend their time at it, and they should attend art schools. For the public school we must limit our aim to what is obtainable by every one.

The main work of February will, therefore, be outline drawing with pencil or with chalk. The ant will be drawn in magnified form and in characteristic postures.

The study of hygiene will be illustrated by drawings of the teeth, diagrams of the chest in inhalation and in exhalation, and sketches showing proper postures in standing and in sitting.

The lumbering industry will require drawings of pines, hemlocks, spruces, oaks, maples, etc.

Draw a maple-sugar camp.

Draw scenes illustrating lumbering, making paper, cotton spinning and weaving, quarrying, ship-building, etc. Draw the manufactured products — Yale locks, Britannia ware, jewelry, watches and clocks, carpenters' tools, etc.

Draw outline likenesses of Captain John Smith, Cartier, Champlain, Bradford, Winthrop, John Alden, Priscilla, Miles Standish.

Draw scenes from the plays, furniture, relics, dress, industries.

Draw Indian scenes — Massasoit, the destruction of the Pequots, etc.

MAKING

Considerable work has already been suggested in preparing scenes for the plays. Plaster models of Boston and vicinity on the sand table, or of old Plymouth, with Governor Bradford's house, the fort, the town brook, Leyden Street, Priscilla's home, and Burial Hill, will repay the time and effort.

Take a clock to pieces and see how it runs. Take a Yale lock to pieces and see how it works. As far as practicable, demonstrate the Yankee notions in ingenious appliances that have come from New England.

Make a pasteboard (or a wooden) model of the old Craigie House, Cambridge, Mass. Other children might be engaged on Independence Hall, Philadelphia, or on Washington's Home at Mount Vernon.



NATURE STUDY

CONTINUE the February study of the ice-sheet. When the thaw comes the children should be ready to see and recognize all the principal features of the retreating "ice age." The work on the "Lion River Glacier" should be a preparation for this observation out of doors. Teach the remnant of the Great Ice Sheet in the Greenland Ice Sheet and the other Arctic Ice Caps.

Note especially the drainage from the melting ice. Some streams will be found to be flowing over the ice and melting out a channel; others will be found to have made their way underground and come to the surface again from mimic ice grottos farther on.

Notice the deposition of dirt by the melting ice, the damming up of streams and the forming of lakes and waterfalls

Take photographs of such scenes for further study indoors. Give such mimic lakes, rivers, glaciers, waterfalls, and grottos suggestive names, as the children love to do so.

Make a detailed study of pond life. The plants, animals, and water of the pond, with the soil of its bed and of its drainage area, form a mutually interdependent community. If you are out of the area of lakes, you may make a very successful study of similar conditions in the schoolroom aquarium. Be sure, first of all, that you have made it as nearly self-sustaining as possible. There must be water plants growing in the water, fish and snails to represent the animal life, and sand on the bottom for the water plants to root in. If vorticellas, fresh-water hydras, spirogyras, etc., can be included, so much the better.

Aim to bring out the mutual dependence of each of these creatures on the others for the continuance of its life conditions. See Friedrich Junge's "*Der Dorfteich als Lebensgemeinschaft*" (Kiel and Leipsic). Study the life activities of each member of the community. If the contents of the aquarium are so chosen that the whole is self-supporting, it will need no other care than to be shielded from disturbance and perhaps to have an occasional bit of food put into it for the fishes.

THE SCHOOL GARDEN

While it may not be practicable at your home to plant anything out of doors in March, such is not the case in all localities. Preparations for the flower and vegetable garden must be begun in March or even in February, in order to have everything as early as possible and as much done as can be before the close of school in June. Follow the advice given in "The Fourth School Year" in regard to preparation for the school garden in March. Especially important is it to enlist the interest and the assistance of those in the neighborhood who know perhaps more than the teacher does from practical experience.

Trees may be transplanted as soon as the frost is out of

the ground. Some weeks had better be spent in studying the subject of soils. The physical and chemical properties of soil may be made very clear, the former concerning drainage of water and circulation of air, the latter having regard to the plant food that the roots absorb. The chief ingredients of local soils should be known before the outdoor work is begun. Samples of the fertilizers should be obtained and the main constituents of plant food should be known.

Consult "How to Make School Gardens," by H. D. Hemenway, and "How to Make a Flower Garden."* H. Ellwanger's "The Garden's Story" (Appleton) will also be found useful for the teacher's reading. "Children's Gardens for School and Home" is a manual of coöperative gardening by Louise Klein Miller, published by Appleton.

Have the children write papers on their favorite flowers and what they know about the care of plants, describing their own efforts in this line. Distribute seeds of favorite flowers, and plan for a competitive flower show in May or June. Give a lesson on preparation of soil and the best way to plant and water. Have plants in the schoolroom windows, and note how the plants respond to difference in soil, watering, sunlight, and warmth. See Hodge's "Nature Study and Life," Chapter VI.

WEATHER RECORD

The special topic for March is rainfall. Find the total rainfall for each of the preceding months. Compare with the average rainfall as given by the Monthly Weather Review. The Weather Bureau publishes a meteorological atlas of twenty-four maps giving summaries, maximums, and minimums for the last twenty-four years (price \$2.50). With this atlas the annual and monthly rainfall of any part of the country may be studied.

* Both published by Doubleday, Page & Co., "How to Make School Gardens," price \$1.00. "How to Make a Flower Garden," price \$1.60.

In what month does the greatest amount of rain fall in your locality? the least?

On the floor map draw the lines bounding the areas of equal rainfall as given on the annual rainfall summary. Ask pupils to step out on the map and, while standing in each of these areas successively, to describe in words its rain conditions and to name states involved in the area. The pupils may represent graphically the average annual rainfall in these areas by indicating with the finger on a decimal ruler. Correlate these areas with the drainage areas of the great rivers of North America.

The Weather Bureau sends out also a weekly Ice and Snow Bulletin during the winter months. With these the annual ice sheet may be studied as it sweeps down on us from the north in the autumn, as well as when it is withdrawing to the north in the spring.

The Weather Bureau also issues from its Washington Office a daily weather map, Form C, showing the daily rainfall areas. These are of great value for teaching correct ideas of the extent of the various storms. Pupils may be called out to represent on the floor map these storm areas — the boys to stand on stations where there was rain, and the girls to take the other positions. In case of storms bringing snow in some regions and rain in others, have the boys represent rain and the girls snow areas.

Arrange in jars water to correspond in depth to the rainfall of the months. One series of jars should show the average rainfall for past years. The rainfall for each current month may then be compared with this standard.

GEOGRAPHY

DURING March we study the region of the Great Lakes and the Mississippi Valley.

Recall the fourth-grade work on the Great Lakes and the

portages to the Mississippi Valley. Mark out on the floor map all of these "carries" in the order in which the French discovered and used them. Note and list the Indian, French, English, and German geographical proper names. Recall the work on the Great Ice Sheet, and mark its boundaries. Recall the chief effects produced by the Ice Sheet.

Regard the chain of the Great Lakes as the upper part of the St. Lawrence River, which therefore starts with the St. Louis stream at Duluth. Lake Michigan makes a large tributary from the south. The main stream passes thru the "Soo," past Detroit, over Niagara, and out thru the midst of the Thousand Islands.

The lake bottoms are all so shallow that, if drained, they would present a vast plain, with hardly a variation from the horizontal that the eye could detect.* If Lake Superior were represented by a lake a mile long, its depth would be two and one-half feet. The Lake Erie basin is still more shallow and level. The lakes are blocked river valleys, altho the gouging of the glacier and the tilting of the land have probably contributed to their formation.

The chief drainage of the Great Lakes was once thru Lake Michigan and the Illinois River; then it was shifted to the Mohawk Valley and the Hudson River; later still it went by way of the Ottawa River and the St. Lawrence River. All the chief water partings have probably served at some stage of the changes as outlets for the lakes formed behind the low height of land, as the glacier melted away on their northern side. Trace these outlets from Lake Superior, from Lake Michigan, from Lake Erie, from Lake Ontario, and from Lake Huron. Identify them with the portages and later with the routes of canals.

All of this is of vital importance to have in mind in order to

* See Brigham's "Geographical Influences in American History," p. 115.

understand the utilization of this great fresh-water Mediterranean for inland commerce. The construction of the Erie Canal, reaching Lake Erie above Niagara Falls, left to Canada the work of digging the Welland Canal. The "Soo" Canal, opened in 1856, deepened to a ship canal in 1877, deepened again to twenty feet in 1896, developed its full importance only when it reduced the cost of transportation by admitting large vessels. Its effects then were far-reaching. It brought about the transfer of the iron industry from the eastern side to the western side of the Alleghenies. Since 1881 iron ore has formed about one-half the tonnage thru the canal.* The westbound traffic in coal is carried at the very low rate of thirty cents per ton to Duluth. The coal, iron ore, flour, and grain make up the chief commodities that pass thru the "Soo," making its tonnage larger than that of the Suez Canal, and nearly half as large as the combined tonnage of our Atlantic, Gulf, and Pacific coasts.

"The value of the Mississippi as a waterway," says Semple, "is enhanced greatly by the fact that it traverses the United States across the constricted area between the Lakes and the Gulf, while these two Mediterraneans, fresh and salt, find their value enhanced in turn by the connecting waterway of the mighty stream." There are two states each of which would reach from Chicago on Lake Michigan to the Gulf of Mexico.

On the floor map mark the head of navigation in the Mississippi and in each of its navigable tributaries. Note the causes of the growth of towns. Most large cities are situated where two or more important lines of transportation converge or cross. Note this crossing of lines at Cleveland, Chicago, Detroit, St. Louis, Duluth, Toronto, Winnipeg, etc.

Treat all the great industries of the Central West with considerable fullness. Remember that this is the most American

* See Semple's "American History and Its Geographical Conditions," Chap. XIII.

part of America, as Mr. Bryce asserts. The size of the region and the enormous scale of industrial activity have had a dominant force in making us a great nation with large ideas. It is of course chiefly an agricultural region, but with the greatest lumber areas in the country included. It embraces the greatest coal, petroleum, iron, copper, and building stone deposits in the continent. This region contains the greatest manufactures of agricultural machinery, of furniture, of wagons, of iron and steel, of flour, of tobacco, and has the greatest plants for the slaughtering of cattle and the packing of meats.

On the floor map pupils may take their positions at the chief trade centers and play the game of inland commerce, making out invoices of goods to be shipped by boat or railway. Other pupils may represent the various transportation companies and distribute the goods. The game ends with the comparison of shipments and receipts by the different cities. Statistics for this purpose are to be found in the Census Reports, in the Commercial Geographies, but the best, most detailed and freshest material is to be sought in the very valuable Monthly Summary of Commerce and Finance of the United States, published by the Department of Commerce and Labor.

HISTORY AND LITERATURE

IN MARCH we study the French exploration of the region of the Great Lakes and the Mississippi.

Note the order in which the portages were discovered and used by the French. Marquette and Joliet went by way of Green Bay and the Wisconsin River; La Salle went by Lake Michigan and the Illinois River. After the founding of Detroit in 1701 to overawe the neighboring Iroquois, the Lake Erie portages came into use, the western ones first. It was not till the middle of

the eighteenth century that the French began to draw their lines closer around the back of the English settlements, and then the portage to French Creek and the Allegheny River led the way to the forks of the Ohio.

Use Fiske's chapter on "Wilderness and Empire," in his "New France and New England." Keep in mind the fact that the explorers were still hunting for a passage thru to the Pacific, and were more or less expecting to reach China if they could find westward-flowing rivers. When Champlain sent Nicollet in 1634 to find out what was meant by the repeated stories of large bodies of water to the westward and of a strange people without hair or beard, the explorers took with them Chinese garb and presents. The town of La Chine and the rapids in the St. Lawrence just above Montreal recall the same idea in connection with La Salle's expeditions.

Make La Salle the central figure in the story. Arrange with the five acts as in a drama:

- I. The great pageant of 1671 at Sault Sainte Marie when the French symbolized their taking possession of the Northwest.
- II. Marquette on the Mississippi in 1673.
- III. La Salle's dream of a Wilderness Empire; he founds Fort Crèvecoeur.
- IV. The disasters of 1679-1681; La Salle's terrible winter walk of one thousand miles to Montreal; the mutiny and desertion at Crèvecoeur; the capture of the mutineers on Lake Ontario; the Iroquois on the warpath.
- V. The finding of Tonty by La Salle at Mackinaw, and their canoe trip of a thousand miles to Fort Frontenac; their winter journey to the head of Lake Michigan and down the Illinois and Mississippi; the planting of the *fleurs-de-lis* at the mouth; and finally the attempt to found a city.

Many of the scenes lend themselves to acting out. This will, perhaps, in places be possible in the open air on picnics. Let the names Frontenac, Niagara, Crèvecoeur, Chicago, Mackinaw, Sault Sainte Marie, etc., be applied to localities in the neighborhood that resemble them, or may be taken to represent them in play.

Read to the children from Parkman's "La Salle and the Discovery of the Great West." For the facts and bearings use Fiske's "New France and New England."

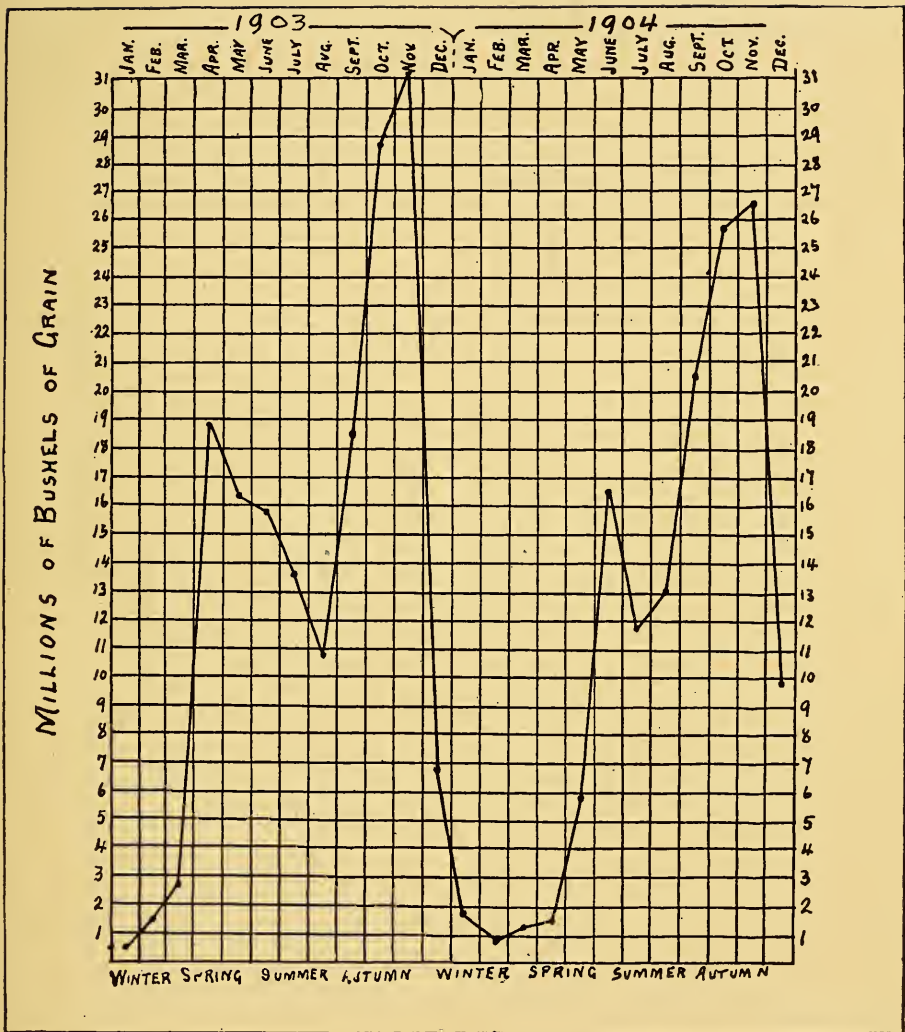
Following the work last month on New England, Longfellow's "New England Tragedies" present a realistic picture of the New England that was contemporary with the explorations of La Salle. Do not weary your pupils with rehearsals, in presenting the plays of John Endicott and Giles Cory of the Salem Farms, but let the children take the parts and act from your prompting. You read each speaker's part in turn while he or she repeats after you — or, rather, with you — the words to be said. All the acting and the scenery should be merely such as to assist in the understanding of the story. Magnify the acting and minimize, improvise, or imagine the scenery and the furnishings. The whole presentation is made but once, and has all the appearance of a rehearsal.

Encourage the selection of such pieces to memorize for the Friday Afternoon Literary Society as Whittier's "The Quaker of the Olden Time" and "Calef in Boston." Read to the class the beautiful poem of "Mabel Martin."

NUMBER

ENLARGE the map of the Central States to double its size, using the method already learned in the work on the Gulf States, Middle Atlantic States, and New England.

Draw the school garden to scale, using the metric system



MONTHLY SHIPMENT OF GRAIN ON THE GREAT LAKES

Explain these seasonal variations in the amount of grain shipped.)

thruout. Two sizes will be needed — one large map for class use and smaller individual maps for the pupils. In this work do not confuse the children and make needless calculations by mixing the metric measurements with feet and inches. Have every measurement in the garden or on either map made in meters, centimeters, or millimeters. Have no calculation whatever of equivalents from one system to the other. Let the children realize in their calculations the immense advantage of the metric system, and get them used to thinking in its units.

For the large map use such a scale as will give a map about a meter long by fifty or sixty centimeters wide. For the smaller map the dimensions should be about twenty centimeters by thirty centimeters. Choose such scales as will give about these sizes. Try to have either the large or the small map to the scale of 1:100. Success in teaching decimals requires that the devices for utilizing place-values in the decimal system of notation shall everywhere be employed. Decimals should be taught with the metric system for the same reason.

Find the area of the school garden in square meters.

Express the area in ares or in centares.

Calculate the area of each of the individual garden beds, the flower beds, the walks, reserved portions, etc., and make out a table showing the percentage of the whole garden that each of these portions occupies.

On a chart divided into square centimeters draw a square to scale (1:100 if possible), representing the area of the garden. Within this square mark out rectangles to correspond with the areas of the various divisions of the garden. The resulting chart will give a graphic presentation of the proportions of the entire area taken by each division of the garden.

From the rainfall record for your home region, calculate the percentage of the annual rainfall of each month. From the meteorological atlas of the Weather Bureau calculate the

seasonal percentages for other typical regions of the United States; e. g., for Los Angeles, for Portland, Ore., for Denver, for Detroit, for Mobile, for Boston, etc. Graphic charts should also be made by dividing circles into sectors to correspond with the seasonal percentages.

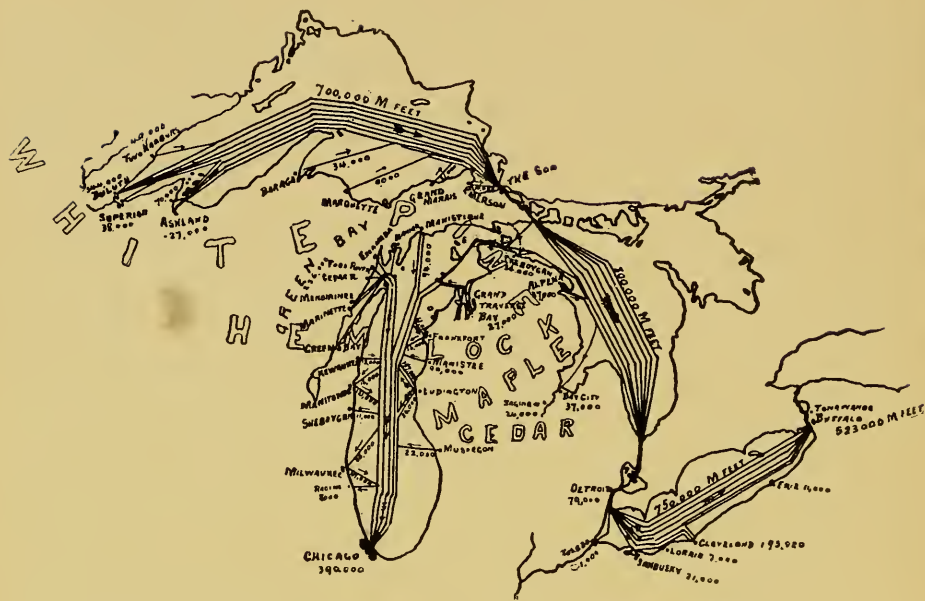
From the "Monthly Summary of Commerce and Finance" prepare a chart showing the percentage of ore, grain, coal, etc., shipped by each of the chief lake ports. Make another one showing the percentage of these articles received by the various chief lake ports. This may be graphically represented on the map by drawing the stream of ore, of grain, or of coal to scale in width and letting this stream branch off to the various ports in widths proportioned to the receipts of the ports. This chart will give a strikingly impressive presentation of Lake Commerce.

Continue the construction of circles to represent the population of cities in the Mississippi Valley and Lake Region.

Find what per cent of the total area of the United States is contained in this section; in each state of this section; in each of the great drainage areas.

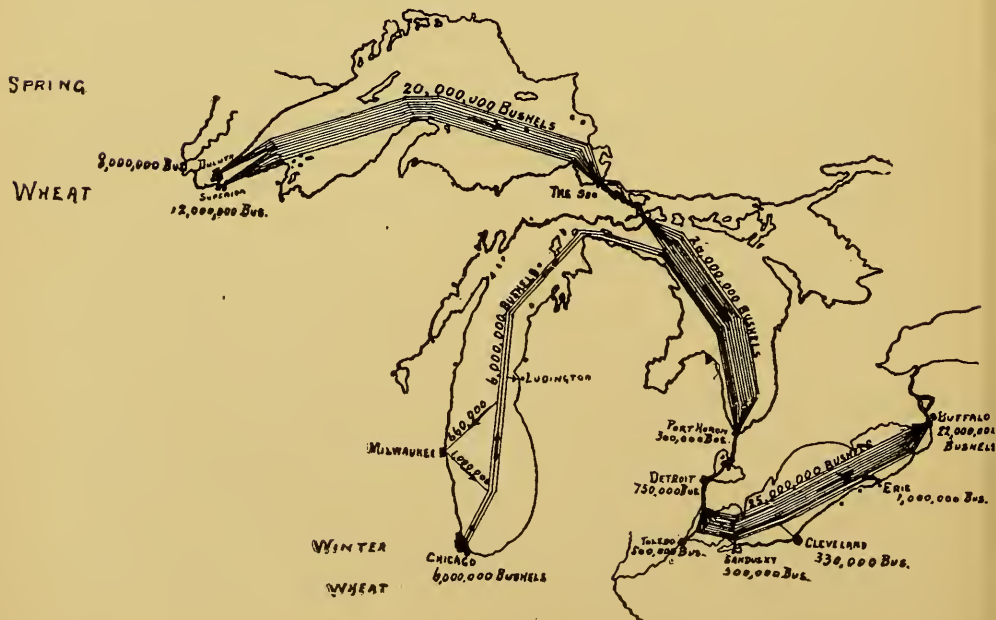
Calculate the density of population in each of the Central States; find the total population of the entire Mississippi Valley; of the entire St. Lawrence Valley; of the Lake Region including the Canadian provinces adjoining.

LAKE ERIE RECEIVES LUMBER 1904



(THE NUMBERS REPRESENT THOUSANDS OF BOARD FEET.)

LAKE ERIE RECEIVES WHEAT 1904



A hand-drawn map of the Great Lakes region showing iron ore shipping routes. The map includes labels for various ports and their respective tonnage capacities. Shipping routes are indicated by lines with arrows, showing the flow of ore from the upper lakes (Superior, Lake Superior) and the lower lakes (Erie, Lake Erie) to the Great Lakes and then to the Atlantic coast. Key locations and tonnage include: Superior (4,000,000 T), Duluth (3,400,000 T), Marquette (2,200,000 T), Escanaba (3,300,000 T), Milwaukee (157,000 T), Chicago (2,565,000 T), Toledo (500,000 T), Detroit (1,400,000 T), Buffalo (2,400,000 T), Cleveland (1,230,000 T), Erie (1,230,000 T), and Pittsburgh (1,230,000 T). The map also shows the St. Lawrence River and the Atlantic Ocean.

A map of the Great Lakes region showing the tonnage of bituminous coal shipped from various ports. The ports and their respective tonnages are:

- Superior: 2,750,000 T.
- Ashtland: 330,000 T.
- Chicago: 1,044,000 T.
- Marquette: 210,000 T.
- Gladstone: 370,000 T.
- Escanaba: 369,000 T.
- Green Bay: 650,000 T.
- Skenosogon: 639,000 T.
- Millwaukee: 3,000,000 T.
- Racine: 110,000 T.
- Waukegan: 115,000 T.
- St. Mary: 5,500,000 T.
- Sault: 2,400,000 T.
- Buffalo: 3,400,000 T.
- Erie: 640,000 T.
- Ashtabola: 2,000,000 T.
- Cleveland: 2,200,000 T.
- Lorain: 1,000,000 T.
- Cambusart: 660,000 T.
- Toledo: 2,200,000 T.

The map also shows the tonnage of coal shipped from the Great Lakes to the Atlantic coast, with a total of 1,360,000 T. The word "BITUMINOUS" is written at the bottom of the map.

LANGUAGE

WU TING-FANG, the former Chinese Minister to the United States, astonished a young woman in Washington by his ready use of good English, and she said to him: "Why, you speak English as well as I do!"

"I speak it better than you do," he replied, with his usual frankness. "I have learned my English from Shakspeare, Milton, Goldsmith, and Burke, while your English, like that current at this time in this country, is compounded of all the slang from the counting-house, the factory, the school-yard, and the race-track. My English has been learned from the masters of the language, while the English speech commonly heard in English-speaking countries is largely made by the careless and illiterate."

To learn to speak correctly children that cannot be kept from hearing bad English must commit a great deal of good English to memory. Children delight in the presentation of dialogs. They can easily be induced to commit to memory correct forms of everyday English in such ways. The repeated rehearsal of such dialogs, expressly arranged to furnish the correct colloquial English, will do more to form correct habits of saying "have gone," "I saw him," "he and I are going to use those books over there," "she could find it nowhere," etc., than any learning of grammar rules will effect. Children usually select poetry for committing to memory. It is desirable that they be induced to commit more prose from classic authors. Some descriptions in Parkman's "La Salle" or in Fiske's "New France and New England" (e. g., the pageant at the Sault Sainte Marie in 1671), or portions from Kipling's Jungle Books, will be likely to have much useful influence in developing their "sentence sense," as well as accustoming them to correct grammar.

For March the Atlases may contain a paper on the retreating "ice age" outdoors; an account of life in a lake or in the school aquarium; a summary of the work done in the study of soils and fertilizers; the plan and scale drawing of the school garden; an outline map showing the average annual rainfall in different parts of the United States; a map of the United States showing the head of navigation in each of the navigable rivers; the charts and maps showing statistics of the Lake Commerce; the density of population and the percentages of areas in the Central States; a tourist's account of one or more of the chief cities of the Middle West (made up from all available sources, especially guide-books and pictures); a paper on each of the five acts in the drama of La Salle; and an abundance of pictures.

GRAMMAR

In March and April we study the participle. First make clear its use when combining verb nature with adjective nature. Its verb nature is shown in its government of complements, its being modified by such adverbs as regularly accompany verbs, or its derivation from a verb. Its adjective nature is shown in its modifying a noun or pronoun.

Bring out these points clearly and concretely in each participle considered. Teach the three participles, present, past, and perfect, together with their formation.

THE ARTS

MUSIC

FOR MARCH the songs are "Jerusalem the Golden," "Now the Day Is Over," and "Robin Adair."

Continue the previous exercises on the minor scale, two-part

singing, and ear-training. Have the children write easy melodies with words from hearing.

DRAWING

Draw fishes in different swimming positions, side views and top views; snails in and out of their shells; robins, ducks, geese; ice-age landscapes at the March thaws; views of cities (copied in outlines); pictures of products and manufactures of the Central States; diagrams and pictures of processes of manufacture, freight steamers on the Lakes, grain elevators, cattle, sheep, hogs, heads of wheat, barley, rye, cornstalks, iron blast-furnaces, river steamers on the Ohio and the Mississippi, Kentucky horses, the reaping machine, the binder, the thrashing machine, farm scenes on the prairies, lumbering scenes, the great pageant of 1671 at the "Soo," Marquette on the Mississippi in 1673, Fort Crèvecoeur, scenes from La Salle's explorations and disasters in 1679-1681, his trip down the Illinois and the Mississippi to the Gulf, the planting of the *fleurs-de-lis* at the mouth of the river, all the scenes from "The New England Tragedies," etc.

MAKING

Lay out a plan of the school garden on the sand table, and divide it into beds by strings stretched from nail to nail at the corners of the beds. Use a definite scale in all of this laying out, so that it will be of the same nature as the work on the real school garden to be cared for next month.

The children should make some bird-boxes and put them in place in the trees or on poles, or on sheltered walls where cats cannot reach them.

Try making a model of a reaping machine. Even if you do not succeed in making it reap, you can succeed in showing how

it works and in making the American Reaper intelligible to children.

Make a section model of a blast-furnace and fill it with ore, limestone and coal.

Dress dolls to represent Marquette and La Salle and furnish them with birch-bark canoes, Fort Crèvecoeur, French flags, etc.

Model a canal lock in the Lion River, using the plastic clay to model around the ends of the wooden framework.

Make a wooden pillory large enough to be used in the scenes from the "Tragedy of John Endicott."



NATURE STUDY

CONTINUE the study of pond life in the life cycle of the frog or toad. Collect the eggs as early as possible and put them in an aquarium with water plants. The early stages of the tadpole are an annual source of wonder and delight that every child should enjoy watching. Have drawings of large size made. Provide an abundance of good pictures of the development of a tadpole and of its anatomy, such as are in George B. Howe's "Atlas of Elementary Biology," published by Macmillan. Have the pupils draw daily from observation and from memory the successive stages showing the changes in shape and in organs. Rapid blackboard sketching is best for this purpose.

The autumn study of the birds was intended to be supplemented by a spring study of them. Set out the bird-boxes and bring out the chart showing the bird census of the neighborhood. Mark the new nests on the chart. Note the revival of insect life. *Country Life in America*, for April, 1903, has an illustrated article on "How to Make a Garden for Birds." Bring clearly to mind the interdependence of birds, frogs, toads, and the insect life around them.

Bring out the tree chart showing the tree census of the neighborhood. Compare with the budding trees again. Joliet, Ill., has nurseries in connection with the public schools for the purpose of raising trees for the school-yards and for distribution among the children for their homes. The nurseries are in the school-yards and the actual outlay in ten years has been but thirty-eight dollars. The trees are raised from seeds and many



STUDYING CRAYFISH

thousands of seedlings have been distributed from the school nurseries. This is more effective than even the arbor-day celebrations. Tree seedlings are very attractive and interesting as well as comparatively rare in the experience of many children.

Take the children to the fields and woods on excursions and picnics. Teach them to love the brooks, the trees, the waterfalls, the singing birds and the humming bees, the wild flowers, the insects, the grass, the clouds, the very stones and rocks. No

set lessons are wanted, but bright eyes and loving interest in the great out-of-doors. Let them hunt for crayfish, watch the minnows and the water skaters, wade in the creek, and build dams, locks, and waterfalls, sail boats and rafts, and make water-wheels and sluices.

THE SCHOOL GARDEN

Our interest in the world about us is measured by our increasing care for plants, animals, and children. An interest in one simple problem of outdoor nature is worth more than all the books can teach without nature. To improve the school grounds is to develop interest in outdoor nature. The improvement of the grounds in tidying them up, in caring for the lawn, and in planting flowers and trees, is of more importance than to teach children to raise vegetables.

The school garden as a source of material for nature study and as a means of teaching gardening and floriculture is a good thing, and we need it, but it is not the first consideration nor the first step to take. The first year, clean up and grade and sow grass seed. The second year, plant. Cover the unsightly fences with vines, screen the out-houses with bushes and trees. Adapt every arrangement to the use that is to be made of it. Leave plenty of space for playground. Avoid all elaborateness of design, and use hardy plants that can take care of themselves during the summer vacation. Utilize the opportunities nearest at hand, woods or running brook, slope of land, vistas, or the like.

If the school grounds are already in proper condition, then we may try a school garden for purposes of direct instruction in the care of plants and of raising material for use in the nature study work. The garden is an outdoor laboratory, and not an ornamental piece of landscape gardening. It will serve

a useful purpose in bringing all the upper classes of the school into coöperative work.

The children of the lower grades may plant seeds, gather wild flowers and set them out. The pupils of the fifth and sixth grades may study habits of growth in annuals, biennials, and perennials; the arrangement of plants to produce succession of blooming or bearing; the means of propagation of plants by cuttings; the improvement of species by grafting, cross-fertilization, etc. The upper grades may attend to the tree nursery and the hot-beds.

As far as practicable, the fifth grade should attempt to raise samples of all the crops that will grow but are not produced in the vicinity. This will naturally lead to the consideration of problems of drainage and irrigation, soils and sunshine.

THE WEATHER RECORD

The special subject for April is irrigation, following up the study of rainfall in March. Make the term itself perfectly free from uncertainty and strangeness by starting with such familiar instances of irrigation as the watering of the plants in the schoolroom window gardens. Irrigation is not by any means confined to the arid or semi-arid regions of the earth. Every farm, even every home garden, has its problem of irrigation.

I remember with what delight I used to enjoy the irrigating of our side yard at home in Philadelphia when I was a boy. We used running streams of water in ditches, flooded the grass-plot, and piped for the farther stretches. Even in the schoolroom an irrigation model may be managed with running water in the place of the "Lion River" in the sheet-iron pan. Construct the model to show one of the irrigation areas in Colorado or California, with a sluice-way, storage reservoir, etc.

In the meteorological atlas published by the Weather Bureau study the area with scant rainfall. On the floor map have the children step out on the area. Note the distribution of rainfall thru the year and the character of the river erosion, as shown in pictures of the Grand Canyon and Rocky Mountain scenery. See the Census Reports, 1902, Volume VI, Crops and Irrigation.

GEOGRAPHY

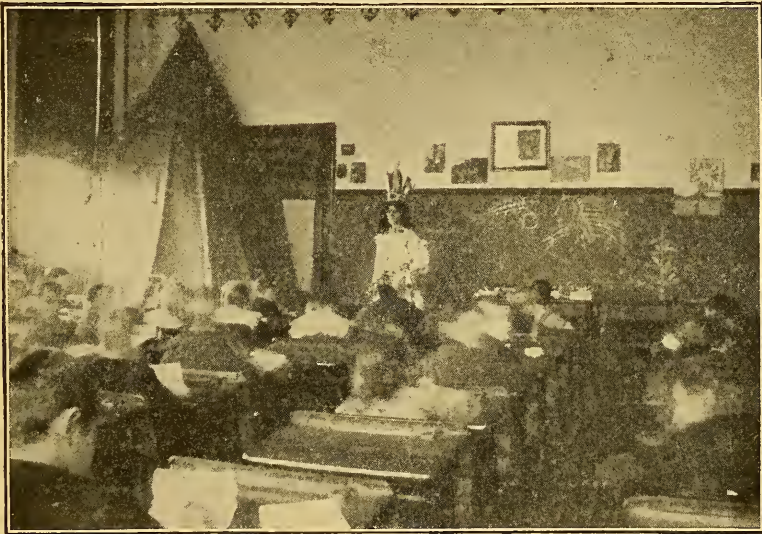
DURING April we pass to the Western States and the Pacific Coast.

Recall the fourth-grade work on the Lewis and Clark expedition, the expeditions of Pike and Fremont, and the study of the Yellowstone, Rocky Mountains, Grand Canyon, and Southern California. Thruout follow the order of discovery of the physiographic features; recall Drake's early visit to Drake's Bay; Coronado's trail; Fray Marco's Seven Cities of Cibola; the voyage of the Columbia; the expedition of Lewis and Clark, of Pike, of Fremont, and of Major Powell down the Colorado. Get as clear a picture as possible of this western region in the days of these pioneer discoverers; then contrast what civilization has been able to make of it by the railroad, by artificial irrigation, and adaptation of crops.

Outline on the floor map the shore line of Lake Bonneville and Lake Lahontan and trace the outlet of the former thru the Snake River in the Glacial Period. These lakes are supposed to have been fed by the ice and snow of the great glaciers in the same period in which were formed the Great Lakes of the St. Lawrence system. Compare in size and depth with the Great Lakes.

Trace well the causes of the scant rainfall of the Western States. Fully one-third of the United States is dependent on irrigation for successful agriculture. Trace the irrigation areas

at present reached by water. Seven and a half million acres are at present "under the ditch." It is estimated that about eight times as much area may yet be reached by the water supply. Why cannot all the rivers be utilized? Why is the water from the upper parts of the river courses more available for irrigation than that from the lower parts? There are at present fifty thousand miles of ditches; yet the enormous cost of all the irri-



MINNEHAHA TEACHING HER STORY

gation works in the country is considerably less than the value of the crops thus raised in a single year. The mining state of Colorado has more than three-fourths as great an agricultural as a mineral output. Consult the section on Irrigation in the Twelfth Census, Volume VI.

The experiment of raising dates in Southern Arizona is very suggestive. The region resembles Southern California and also in many respects the southern and western shores of the Med-

iterranean. In 1900 the Department of Agriculture at Washington, coöperating with the University of Arizona, brought over from Algeria shoots of the best varieties of dates, and the prospect is fair for success. Tell how the navel orange was produced. What other new fruits has Luther Burbank originated?

Mark on the floor map the chief passes in the Rocky Mountains and the trails of the pioneers. Note how these are followed by the great transcontinental railroads to-day. Geographical conditions have determined the Salt Lake oasis as the great railroad center for the region between the Rockies and the Sierras. Here unite the old Oregon Trail, the California Trail, and the old Spanish Trail to Los Angeles.

Study with some detail the typical industries of portions of this section — gold-mining in California and Colorado; copper-mining in Montana; ranching in Wyoming and Montana; lumbering in Washington and Oregon; fruit-raising in California; wheat-raising in the Great Valley; salmon fishing in the Columbia.

Denver, Salt Lake City, San Francisco, Los Angeles and Portland are not to be judged by the same considerations of population as cities in the east. Denver is the business and financial headquarters of the Rocky Mountains, and each of the far western cities is the focus of larger interests than belong to cities of the same size in the east.

HISTORY AND LITERATURE

A LARGE part of the work just outlined under Geography is historical; but, as it has been gone over in the fourth grade, it is recalled now in connection with the geography of the Great West.

The other chief historical material for the month of April continues the story of geographical exploration in the extreme

north and northwest parts of America. Follow the attempts to find a Northwest Passage to Cathay by Martin Frobisher, John Davis, Henry Hudson, and William Baffin. Note the bays and straits named after them. Sketch Peter the Great's expedition under Vitus Bering in 1724-1728 that resulted in proving that the mainland of North America was not connected with Asia.

This exploration by Bering marks the conclusion of the discovery of America so far as the outline of the continent is concerned. Many other interior regions remained to be explored. Trace the work of Alexander Mackenzie and George Vancouver.

Treat briefly the history of the attempts to cut a canal at Panama. Show the importance of the cut for commerce. Have the children appreciate it as the opening of the westerly route to India. Compare with the Suez Canal, which opened the easterly route to India.

Read some of Thompson-Seton's stories of western animals; e. g., "Wahb," "Tito," or others in "Wild Animals I Have Known." Mary Austin's "The Land of Little Rain," published by Houghton, Mifflin & Co., is a very entertaining and suggestive book on life in the arid West. President D. S. Jordan's "Story of Matka and Kotik" has much of the atmosphere and spirit of the Mist Islands in the northwest.

NUMBER

ENLARGE the map of the Western States to double or to quadruple its size in the book.

Continue the construction of circles to represent the population of cities in the Western States. Compare these cities with eastern cities in population. Find the ratios correct to the tenth's figure.

Find what per cent of the total population of the United States is contained in this section.

Find what per cent of the total area of the United States is contained in this section; in each state of this section.

Calculate the density of population in each of the Western States.

How many gallons of water are required to cover an acre of ground to the depth of one inch?

How many tons does this amount of water weigh?

For irrigation in the arid regions there should be for the ordinary crops at least enough water during the growing season to cover the ground from four to six inches in depth each month. How many gallons does that take per acre?

LANGUAGE

A good story well told is admirable for its training in language. Why do so few people succeed in bringing out the point of a story that they are telling? In part they fail to grasp the point themselves, in part they lack skill in language to put the point effectively. The best results will be attained by having individual pupils tell fresh stories orally to the class. An appreciative audience is essential. Stories of limited length could profitably be used as responses to roll-call in the society.

For April the Atlases may contain an illustrated life history of the toad; records of picnics with kodak pictures of favorite spots and scenes associated with enjoyment of the out-of-doors; a few good stories well told; a map of the school garden with the record of work therein; the enlarged map of the Western States; condensed accounts of the origination of the navel orange; the work of Luther Burbank at his Experiment Farms at Santa Rosa, California; a condensed life of one or more of

the great explorers of the west or northwest; the statistical charts growing out of the number work, etc.

Draw tadpoles, fishes, budding trees, sprouting twigs, birds, and school garden scenes; Lewis and Clark sailing up the Missouri; pioneer St. Louis, Astoria and San Francisco; pictures of the Big Trees; irrigation, gold-mining, and lumbering scenes; sketches of cowboys, cliff-dwellers, Wahb and Tito thru their various experiences, and Kotik and Natka of David Starr Jordan's story.

GRAMMAR

The topic is the construction of the participle when it has verb nature and noun nature.

Keep patiently before the children's mind the ways in which the participle shows its noun nature and its verb nature. Compare these constructions with those studied last month. Compare with similar constructions of the infinitive.

Distinguish in meaning between such constructions as, "I saw him whisper," and "I saw him whispering"; "I will try to remember to do so," and "I have tried tying a string around my finger, but, though I remember asking the name a second time, I cannot recall it now."

THE ARTS

MUSIC

FOR April teach the old Welsh melody, "All thru the Night," Tennyson's "Crossing the Bar," and Schumann's "We Lay Us Down to Sleep."

These selections are beautiful in rhythmic and interval effects. The two-part singing may be continued with them.

DRAWING

Draw the tadpole in different stages and postures; frogs and toads, jumping and sitting; more birds in various poses; trees in bud and early leaf; landscape scenes on the picnics; human figures constantly, whenever there is a chance for practice; the explorers Lewis and Clark, Pike, Fremont, Powell, Mackenzie, Vancouver; Rocky Mountain views. Make sketches on the blackboard of the Grand Canyon; geysers; Big Trees; Indians of the plains; Custer's massacre; the completion of the Union Pacific Railroad; gold-mining, orange orchards, etc.

MAKING

In April the attention to the school grounds and garden will demand all the time that can be given to them.



NATURE STUDY

For May and June nothing could be more appropriate than the study of brooks on our out-of-door excursions. "The Brook Book," by Mary Rogers Miller, opens up to us some of the delightful possibilities of nature study by the brookside. The running water is like a thing alive and doing something, murmuring and babbling, digging and rolling the stones, reflecting the sparkle of the sunlight, or spreading out into a placid pond of deeper water. The minnows, the newts, the crayfish, the snails, the leeches, the larvas and adults of the various water insects are never-ending sources of interest to healthy children.

In the brook itself we have all the features of a river in miniature, so that we can oversee the whole formation and trace cause and effect. Children delight in giving local names to places and features that in any way resemble places they have read or heard

of, as, for example, Minnehaha Falls in "Y" Hollow and Niagara in Buffington's Ravine. Thus, the local landscape may soon be filled with associations of Columbus, De Soto, Marquette, Miles Standish, William Penn, Roger Williams, etc. On



IN THE BROOK

a neck of land the children cut the Panama Canal; on a peninsula connected by a narrow neck to the mainland they lay out the town of Boston. In yonder larger bay they see a resemblance to the Gulf of Mexico, and proceed to increase the resemblance by building the West Indian Islands and Florida; soon boats

are sailing over the waters, and the Mississippi is opened up. With the rehearsal of the scenes of the discovery of America fresh in mind the Penn Treaty Elm is found, the Charter Oak again receives the Connecticut Charter for safe-keeping, the band of explorers again journeys up the Missouri to its head waters and over the ridge back of town, to descend on the other side into the valley of the Columbia. In the afternoon we return up and over the divide with two parties under Lewis and Clark and meet at the mouth of the Yellowstone before coming into town.

Teach the children to appreciate natural beauties and innocent pleasures, avoiding all that injures or mars. Thus, the wild-flowers, the mossy banks, the carpets of ferns, the violets and trailing arbutus will not be ruthlessly torn up as merely private possessions, to be snatched from their setting to die in the hands and later be dropped by the roadside, but will be enjoyed where they are, and the lovely ravines will begin to be rightly appreciated. Such places should be used as parks for children and older people to ramble thru, as sacred to nature worship, as important in their way for the full emotional life, as are churches and theaters.

Of course, if you have a school garden, a considerable part of the time for nature study in May and June will be devoted to the flowers and vegetables. If the start of the work has been made early enough in March and April, by May and June flowers and fruit will already begin to show. The June Flower Show may appropriately include plants grown either in crocks at home or in the school garden. It may serve all the good purposes and embrace all the good features of the horticultural and agricultural fairs.

The school garden will need the attention of volunteers to look after it for the summer vacation. This attention should be planned in advance, and should have reference to the autumn



MAP SHOWING SEASON OF MAXIMUM RAINFALL

work in the school garden in September and October. If it be possible to organize the work as a vacation school, so much the better.

If for any reason a school garden is not feasible, the class may try hatching chicks in an incubator and raising them in a brooder in the schoolroom. As they grow too large for the brooder they may be distributed among the children for home raising.

If it be preferred, the time may be devoted to gathering and preserving an herbarium.

THE WEATHER RECORD

In May and June it is planned to study climate by means of the monthly and yearly summaries of the chief elements that are involved in climate. It is intended to pass in review the seasonal changes in temperature, moisture, wind, sunshine, and length of day for the whole year.

On the floor map the changes of position of the monthly isotherms will be represented by the movement of a line of boys or girls on the map marking the average monthly temperature as it recedes southward in the autumn and returns northward again in the spring. The seasonal changes in rainfall may be represented similarly.

The changes in length of day at different latitudes may best be represented by charts or by discs divided proportionally into sectors corresponding to day and night. (See page 124.) If a hundred such adjustable discs are arranged to represent the proportion of day and night on January 1st in the several states of the United States, they may then be laid on the floor map in their respective states and we shall have a fair diagram of the daylight proportion for the whole country. Now rearrange the discs for July 1st and note the great contrast in

the proportion of daylight. This change may be followed throughout the year.

The average annual range of temperature may also be represented by sticks cut to scale (one inch to a degree) and stood up on the floor map. A similar method may be used to represent the thermal anomalies. Compare charts in William M. Davis's "Elementary Meteorology," page 72 to page 74.

The advance of the annual ice and snow sheet southward in autumn and its retreat northward in spring may be very vividly represented by the movement of a line of boys and girls southward and then northward on the floor map, corresponding to the positions of the edge of the ice and snow sheet in the different weeks of autumn, winter, and spring.

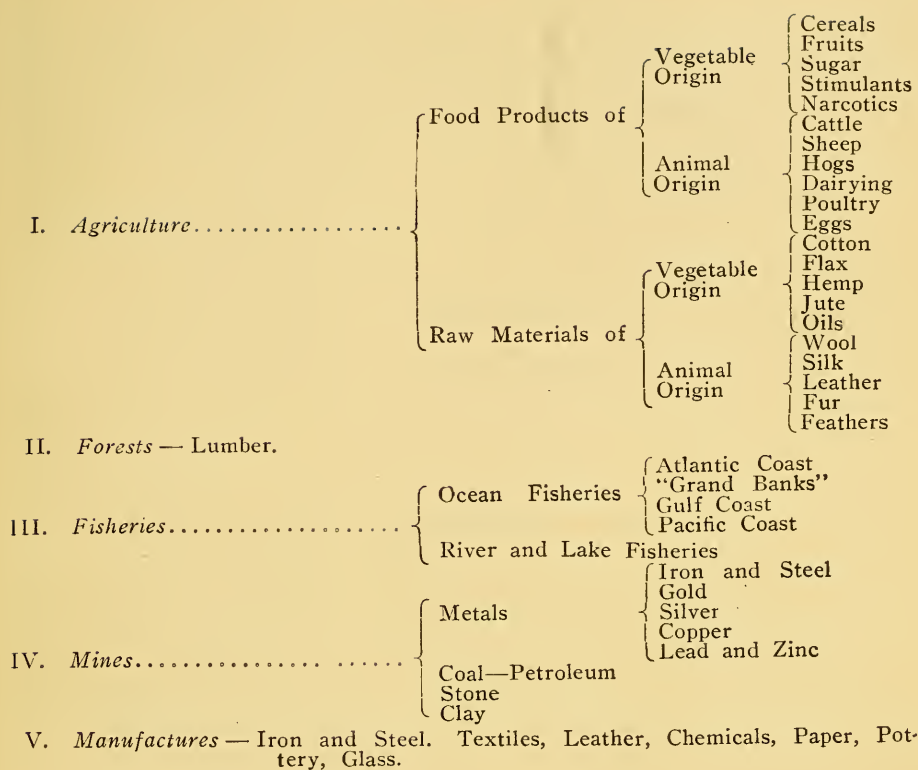
GEOGRAPHY

DURING May and June we study the commerce and manufactures of the United States: first, the domestic commerce; secondly, the foreign commerce.

In our study of the industries of the different sections of the United States in the preceding months the work has been grouped by sections, and we have followed the march of the explorers and settlers, the pioneers and the frontiersmen. In May and June we review the present work of the nation as such, arranging the materials by industries, in order to study the commerce that grows out of these conditions. It is the geography of the present.

The outline on the opposite page, which is substantially that used by the United States government in its reports, is our guide.

Have the children prepare and place on the different areas of the floor map signs for the different industries conducted there; e. g., the cotton area of the South may be covered with cotton; pictures of cod, oyster boats, cattle, sheep and horses



may be stood up on the appropriate parts of the map; specimens of wool, flax, silk, leather, coal, stone, clay, wheat, corn, barley, hay, iron, ores, cloth, clothing, paper, etc., may be put on areas to denote the respective industries there carried on.

Now, with a previously gained knowledge of the density of population in the different parts of the country, the children will be ready for the understanding of the domestic commerce. Different children may be assigned to the chief commercial centers, as, New York, Boston, Philadelphia, Chicago, New Orleans, San Francisco, etc., to study the receipt and despatch of freight.

Statements may be made out of goods sent corresponding to the actual figures for the cities so sending. These may be carried by other children (representing transportation com-

panies), exchanged at the various trade centers as they come to these for other bills of lading, to correspond with the make-up of new freight trains or boats, and handed over finally to the cities containing the consumers, or else reaching the seaports for foreign export.

In this way the business of the great transportation companies may be graphically acted out, and the reasons for the location of the chief trunk lines made clear. The nature of trade centers will thus be brought out. A typical trade center, e. g., Pittsburg, Minneapolis, or San Francisco, may be studied with more detail.*

The movement of great staples — as wheat, cotton, iron ore, lumber, etc. — may be followed singly, and thus their relative importance shown. It would be well to have separate maps drawn for each staple product, showing the areas of production, the areas of manufacture, and areas of consumption.

The foreign commerce should be succinctly treated under the heads of imports and exports. For each article of import or of export we should have a map of the world showing the producing area and the consuming area.†

HISTORY AND LITERATURE

WE REVIEW in May and June the work of three centuries of discovery and exploration of America, from the time of Columbus to the time of Jefferson. In the months from September to April we followed the progress of geographical knowledge and settlement; in the review in May and June we follow the varying fortunes of the European nations that took part in the enterprise.

* See McMurry's "Type Studies from United States Geography," p. 154.

† See map "The United States in the World's Markets," in Chapter X of Trotter's *Geography of Commerce*, published by The Macmillan Company.

The wreck of the Santa Maria on Hispaniola determined the site of the first European colony in the New World. This became the center for all the Spanish expeditions and the spread of the Spanish occupation. Spain claimed the whole of the continent both north and south, and, as she thought, had it confirmed to her by the Treaty of Tordesillas in 1494.

Recall the Spanish conquest of Peru, of Mexico, of Florida. Trace the explorations of Coronado and Fray Marcos. On an outline map of North and South America shade the parts occupied by the Spanish claims, making the shade very light in the unknown regions but denser in the parts actually under the Spanish rule till the close of the sixteenth century.

The Spanish struggle with heresy, with the Moors, with the Dutch, and with England brought her from her proud position of preëminence. The defeat of the Armada in 1588 opened the way for English colonization.

France and England, as rivals of Spain and as rivals of each other, now began feeling their way into the settlement of North America. France entered into the interior of the continent for the fur trade, and hence explored up the St. Lawrence, the Great Lakes, and across the carries to the streams that flow into the Mississippi. New France and Louisiana were thus the St. Lawrence Valley and the Mississippi Valley. The English, going much more slowly, settled close to the coast, but founded self-governing communities.

The contrast between the French dominion and the English colonies must bring out why the latter became the refuge for the persecuted of all nations. Unlike the Spanish and French colonies that involved the conquest, subjugation, and spoliation of the native races, the English colonies were free and self-governing communities that had dispossessed the Indians. When the struggle between England and France came in the great conflict from 1689 to 1763 it was the difference in the

colonies more than the help from the mother countries that decided the issue. The colonies of Sweden and Holland were but ventures of trading companies, and yielded almost without a struggle.

On an outline map of North America color in yellow the area of French occupation in 1689 and in red the area of English settlement. The part still held by the Spanish may be shaded. Leave in white the unexplored portions. This map will leave the next epoch of struggle between France and England for colonial possession as an already interesting problem for the children preparatory to entering the following grade in next September.

List the areas explored, the rivers discovered, the lakes, falls, capes, islands, etc., named by the Spanish explorers. In each case give the date and the explorer's name. Make a similar list of French and English explorations. A short list will suffice for Holland and Russia.

On an outline map of America color all regions explored by the Spanish, the French, the English, the Dutch, and the Russians with distinctive coloring, to bring out clearly the part taken by each nation in the work of exploration.

Why did Portugal take no part in the discovery or exploration of North America?

Why did Germany take no part? Why did not Italy and Greece take part?

Why did not Russia begin exploring in North America sooner? Can you find any reason why she gave up, and sold out to the United States in 1867?

Describe briefly the character and purposes of the Spanish explorers; of the French explorers; of the English explorers; of the Dutch explorers; of the Russian explorers. State the radical differences between the settlers of the rival nations and their purposes in colonizing.

For May and June we read from William J. Long's "School of the Woods," David Starr Jordan's "Story of a Salmon," or Charles G. D. Roberts's "The Kindred of the Wild." We choose poems of nature to commit to memory from Wordsworth, Whittier, Lowell, or Browning.

NUMBER

A GREAT deal of arithmetic will be necessary in the weather work and geography above outlined for May and June.

The study of the foreign commerce of the United States will make desirable the comparison of the countries with which we carry on commerce and our own, in area, population, and value of the chief products. This comparison may best be made by finding the ratio of the area, population, etc., of the United States to the area, population, etc., of the foreign country. These ratios should be carried out to the tenth's figure.

The year's work in arithmetic should be brought together into systematic order and reviewed as an independent subject. Have some calculations in all the four fundamental processes by the old Roman notation. Contrast this with the Arabic notation and numeration.

State the rules for finding circumference and area of a circle; surface of a sphere; square root.

Review the topics of average, ratio, proportion, percentage.

Review the imagery of the process of finding area by multiplying the number of units of measure in each row by the number of rows.

Review and summarize the metric system of weights and measures.

Have the four processes in decimals reviewed.

LANGUAGE

ARRANGE with other schools or with other classes of the same school to exchange letters. Have the children write to definite individuals, and not merely address the letters in blank. The letters may profitably include a review in summarized form of the work of the year. One letter may be devoted to the nature



HUNTING SNAILS' EGGS

study and the answer to it may be on the same subject or may include another. This answer will, no doubt, suggest the next topic on which to write, or the subject may be the work in geography for the year. The next letter may tell of the work in history, and the following one be devoted to the books read; the next may describe the work in arithmetic, language, etc. One letter may tell of the Literary Society, another of the Junior Naturalist Club, another of the school garden, or the class picnics, etc.

For May and June the Atlases may contain copies of the above correspondence; record of work in the school garden, with photographs showing the progress made; the maps and charts showing the weather summaries for the year; the maps in color to show explorations of the various nations in America; the written summary of the industries of the United States, following the outline given above under geography, and a similar summary of our foreign commerce by items.

Draw the outdoor objects seen on excursions; sketch trees, crayfish, insects, wild-flowers, children wading in the brook, birds' nests, chickens, school garden scenes, flowers for the June Flower Show, railroad engines, freight and passenger cars, canal boats, grain elevators, wharves, river and ocean steamers, bridges, etc.

GRAMMAR

If the need of knowing the various verb phrase forms has not already shown itself and led to their being taught, it will be high time now to get them mastered by running thru them all in the full conjugation of the verb. No definitions are wanted, but simply the grouping of the forms by persons and tenses, and getting used to them by going thru a few verbs until the forms are familiar.

All the constructions taught during the previous months should be reviewed and thus a general survey of the year's work be obtained.

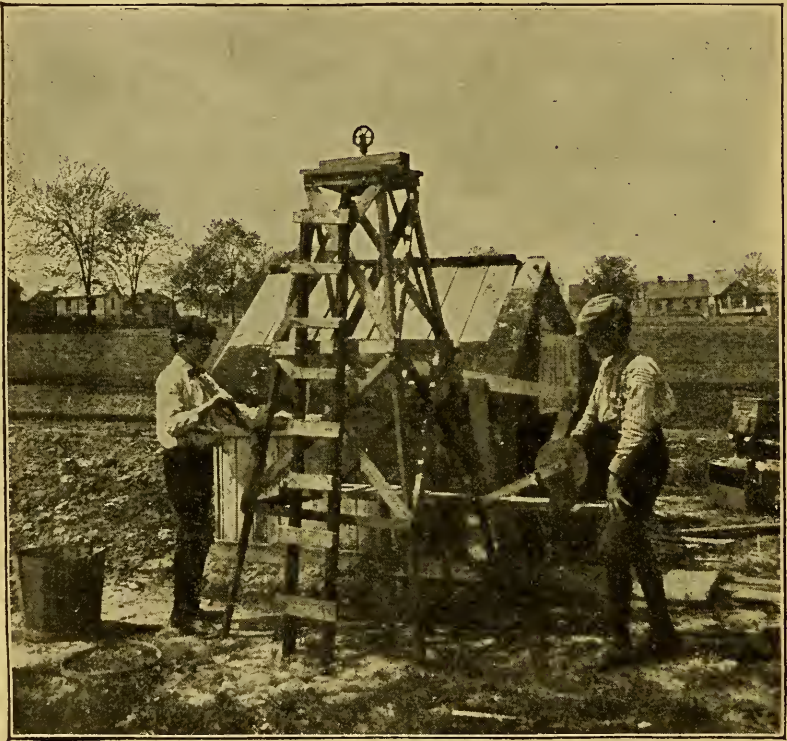
THE ARTS

MUSIC

THE main selection for May is "O Rest in the Lord," from Mendelssohn's oratorio of "Elijah."

In connection with Decoration Day learn the "Soldiers' Chorus," from Gounod's "Faust," as a two-part song. Longfellow's "Decoration Day" requiem also is appropriate and fine.

In June, toward the close of school, have a musical afternoon, and invite the parents to be present. Freshen up all the



THE OIL DERRICK

work of the year for this occasion by review, and then give the cream of the selections in a program entirely devoted to music. Some of the numbers may be papers recounting the chief facts in regard to composers, or their works, or some of the most important historical steps in the development of music. If possi-

ble, have one or more numbers by the best procurable outside talent.

DRAWING

If the work in drawing has received the attention here demanded for it, and if this practice has been concentrated on outline drawing, I believe the children will show a progress in facility of representation with the pencil that will surpass their progress in any other subject. The one essential thing is patient and persistent *practice*. Practice will overcome every difficulty, and the result is worth all the time spent on it. Children of the fifth grade can do surprising things in drawing.

Continue to illustrate every lesson, every piece of written work, every recitation, with large blackboard sketches as well as with pencil drawings on paper. The teacher's part is to demonstrate by example the value of facility in drawing, to offer opportunities, and to encourage with suggestions as to subject and technique. Much good may be obtained by studying and imitating the simple technique of good drawings by the masters of the art. Very little explanation is needed by the children, but plenty of good examples in drawing.

MAKING

In May and June the garden will demand a large part of the available time. Picnics will be more profitable than staying indoors at work.

But when the weather is inclement the children may make boats of various kinds, from the simple rafts, skiffs, and dugouts, to the river steamer or ocean steamship or sailing vessel. These craft should be taken along on picnics and many of the facts of commerce may be learned in the delightful fun of sailing boats on the pools in the brook, wading in after them as Gulliver did with ships of the Lilliputians.





1880

1890

1900

1901-EDWARD VII

1899 HAGUE CONFERENCE

GLADSTONE
BISMARCK
† 1898

THIRD
REPUBLIC

W. C. T. U.

NANSEN
1893-1896

PEARY
1891
"THE FRAM"

POLAR EXPEDITIONS

INTERNATIONAL
1891
COPYRIGHT

END
OF
SPANISH
RULE
IN
AMERICA



1883

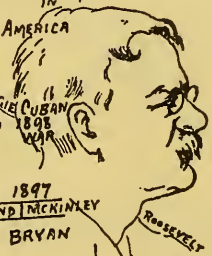


STANDARD OIL



ANDREW

CARNEGIE
CUBAN
1898
WAR



PANAMA
CANAL

MISSISSIPPI JETTIES



EDISON
1884
ELECTRIC LIGHT

1877 1881 1885 1889 1893 1897
GRANT HAYES ARTHUR GARFIELD CLEVELAND HARRISON CLEVELAND MCKINLEY BRYAN

CIVIL SERVICE
REFORM

1893
PANIC

COLUMBIAN EXPOSITION
1893
CHICAGO

COTTON EXPOSITION
1881
ATLANTA

PAN-AMERICAN
1901
BUFFALO

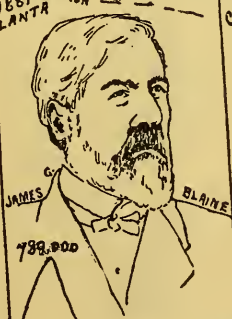
LOUISIANA
1904
PURCHASE
ST. LOUIS

857,046

20,000,000
IMMIGRANTS
SINCE
1800

PHILADELPHIA

GERMANY



JAMES

BLAINE

739,000

CLAIMS

457,257

GERMANS

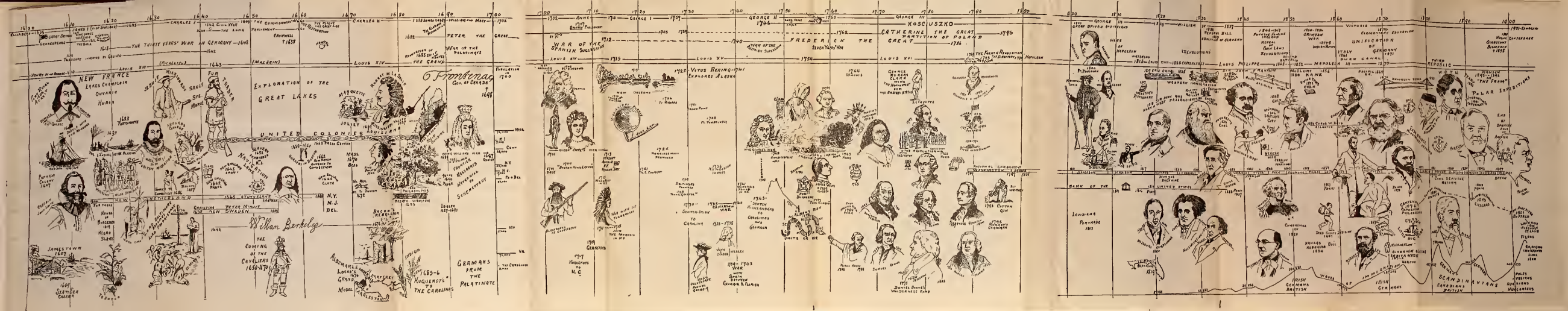
SCANDINAVIANS
CANADIANS
BRITISH

455,302

GERMANS

448,572

POLES
ITALIANS
RUSSIANS
HUNGARIANS



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